The Indian Medical Gazette

THE

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FOR THE YEAR 1904.

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Original Articles.

DOCTORS AS CIVIL AND POLITICAL OFFICERS.

BY D. G. CRAWFORD,

LIEUT.-COL., I.M.S.,

Civil Surgeon, Hughli.

WHEN, after the final suppression of the Mutiny, the Government of India was transferred from the Company to the Crown, considerable changes took place in the various branches, military and civil, of the Company's Service. Among others, the fate of the Indian Medical Service was under consideration, and for long hung in the balance. For over four years, October 1860 to March 1865, no new commissions were given in the Service, pending a decision as to its fate, whether total abolition, amalgamation with the Army Medical Department, or a renewed lease of life. For some time the second appeared to be the most probable decision. Indeed, matters went so far that the *Lancet* of 27th June 1863, quoting from the *Times of India*, gives what were at that time supposed to be the terms on which amalgamation would take place. These terms, in brief, were that all officers of the Indian Medical Service were to be transferred to the Army Medical Department, the new Infantry Regiments then being added to the British Army, were to be officered from those among them who volunteered for general service; those who did not so volunteer were to serve in India only, and were to retain a prior claim to Native Regiments and to civil appointments; all alike were to retain their claims on the funds, which would be guaranteed by Government; all were to be allowed the choice of Indian or British pension rules; a sufficient number of promotions from Assistant-Surgeon to Surgeon to be made, to equalize the proportion of Surgeons to Assistant-Surgeons with that in the Army Medical Department; promotion to Surgeon-Major to be made at twenty years' service, without deduction of periods spent on leave; pay to be consolidated, and headmoney abolished. Commenting on these terms, the *Lancet* remarks that the senior officers of the I. M. S. will get little benefit from amalgamation, but the juniors will obtain a great acceleration of promotion However, all fears of amalama tion were put to rest by the issue of the new I. M. S. warrant of 7th November 1864.

It was during this period of deliberation between the assumption by the Crown of the Government of India and the issue of the new warrant of 1864, that the minute by Outram, from which the following paragraphs are extracted, was written. This minute is dated 2nd January 1860. Sir James Outram was then Military Member of Council in India, a post which he held from April 1858 to July 1860.

"The preliminary education of medical men places them on a level, in respect of intellectual accomplishments, with the *average* of those with whom it is our good fortune to recruit our Covenanted Civil Service,—and above the average of our purely military officers; and their profession of (professional?) education gives them special qualifications for aiding in developing the resources of the country, and in ameliorating the condition of its inhabitants. They are necessarily acquainted, to a greater or less extent, with Geology, Botany, and other branches of Natural History. To their researches do we owe most, if not all, the economic discoveries in Natural History by which the East has of late years enriched the industrial resources of the world. And it is superfluous to indicate the many benefits which a knowledge of Natural History will enable a district officer to confer on the people of his district. As superfluous is it to dwell on the vast importance to the people of this country, amongst whom one overworked Civil Surgeon can rarely travel, that their District Officers should have that knowledge of the laws of health and of practical sanitary economics which is demanded of every candidate for a medical diploma. The knowledge of Medical Jurisprudence, possessed by every medical man, would be of incalculable value to district officers in the detection and prevention of crime, enabling them to arrive at definite and correct conclusions in very many cases wherein, from want of such knowledge, doubt must under existing arrangements necessarily exist in their minds, to the detriment of the interests of justice; and, as in the case of the doubtfully insane, to the danger of life and property, and the prolonged sufferings of the helpless. And, to conclude a series of illustrations which might easily multiply, I need but glance at the boon that would be afforded to the villages in the more remote parts of the country by the occasional passage amongst them of gentlemen competent to afford them medical aid,—to give sight to the blind, hearing to the deaf, and ease to the suffering,—who, but for the advent amongst them (for magisterial and fiscal purposes) of 'a kind physician skilled their wounds to heal' might for ever seek relief in vain from the local native practitioner.

"Believing, as I do, that medical officers are admirably qualified for civil executive duties, and that their extensive employment in such duties would be advantageous to the material and social interests of the people, I am not less satisfied that it would tend to the elevation and improvement of the Medical Service itself. In the medical, as in all professions, there are 'round' men, whom a mistake on their own parts, or an ill-judged selection on the part of their parents and guardians, have thrust into

'square holes,' men who, with little natural taste or aptitude for the healing art, have high qualifications for the performance of other duties; and it is, I conceive, eminently desirable that men of this description should not only be permitted, but invited, to transfer themselves from an uncongenial to a congenial sphere. Such a transposition is effected in England by the existing arrangements and demands of society; in India it can only be effected through the interposition of Government. And by encouraging it, the Indian Government would not only strengthen their civil establishment, but greatly add to the professional prestige of their medical corps. Would it have promoted the welfare of the sick, the political interests of England, or the reputation of the Indian Medical Service, had Sir John Macneill been compelled to remain in medical charge of a *Zillah* instead of representing his country in Persia; or had Dr. Lord been kept attached to a regiment of Native Infantry? Were the years during which Horace Hayman Wilson was condemned to feel pulses and to examine tongues (because he was an Assistant-Surgeon) considered as profitable to himself, his patients, or the world at large, as they would have been had his marvellous philological genius been provided with the full scope and free development that a professorship would have afforded? Did not the public voice of England ridicule and condemn the persistent confinement to professional duties of the accomplished brother of Sir Alexander Burnes, who, but for the real experience of our Service, might have achieved a name as great as that bequeathed by his illustrious relative? Not five years have elapsed since very cutting strictures were made in the medical periodicals on the regulations which compelled Lord Elphinstone—whose constant and anxious effort it is to put 'the right man in the right place'—to keep Liebig in charge of a native hospital, and the son of the ornithologist Gould, —a man hardly less versed in ornithology than his father,—in medical charge of a Government steamer, principally employed in conveying troops and commissariat stores between Bombay and Kurrachi.

"By admitting medical officers to civil and miscellaneous posts as freely as our military officers, no additional cost would be incurred, and no embarrassment would be occasioned to the operations of the Medical Department. For when it became known that through that Department the general service of the State could be entered, and that, by the elimination from its effective strength of officers having administrative tastes and aptitudes, departmental promotion was accelerated, we should not only find an abundance of candidates presenting themselves at the competitive examinations in London, but candidates of even a higher calibre than we now secure. For seldom as I look into medical periodicals, I am well aware that the gentlemen now in our Service do not send home encouraging reports of the manner in which we treat them, and at the recent competitions in London, but forty-three competitors appeared for upwards of fifty appointments. By opening to them the posts I have named, and treating them, in reference to promotion, in the same spirit of liberality as the medical officers of the Royal Army have been treated, we should make the Local Medical Service as popular and as highly esteemed as the Local Military Service."

The suggestions made in Outram's minute, as to the frequent employment of medical officers in an executive capacity, and their transfer from the Medical Department to other branches of the public service, will no doubt sound strange nowadays. For a quarter of a century past no medical officer has been serving as a regular member of any of the "Commissions" which, including military and uncovenanted officers as well as members of the Indian Civil Service, administer the Non-Regulation Provinces; and for the last five years there has been no medical officer in the ranks of the Political Department other than those employed on purely medical work. But five years and twenty-five years are short periods in the life of a service. It is, no doubt, improbable that medical officers will ever again serve in the Commissions; more especially as the general tendency of the time is to restrict such employment more and more to the Covenanted Civil Service. The Bengal Commission, indeed, has vanished altogether, and the places which, twenty years ago, were held by fully a dozen military and uncovenanted officers, are now all filled by the Indian Civil Service. The officers of the I. M. S. enter that Service for purely medical work, using the word medical in its wider sense, as including various branches of science. Cases in which an officer shows evident aptitude for work other than that for which he has been specially trained must always be rare, though from time to time they do occur. Military officers in India have attained the highest distinction in Civil Administration, notably Sir John Malcolm and Sir Henry Lawrence. Even stranger is the fact that a young civilian, of little account in his own service, should rapidly develop into the most brilliant soldier, the most successful general, of his time. Yet this is exactly what was done by Clive, a junior writer. The Indian Medical Service has never had in its ranks any officer who has attained to the fame of Malcolm or Lawrence, much less of Clive. Yet, on the whole, it is surprising how many of its members have been employed on work, executive, administrative, or political, foreign to their proper sphere of duty; and how successful, on the whole, have been the officers so employed. Two indeed, Holwell and McNeill, attained to no small honour and success. To give a short account of the careers of some of the officers thus employed on extra-professional work is our present purpose.

Gabriel Boughton and William Hamilton did great service to and conferred great political benefits upon the Company and their country, but the charters granted by the Musalman rulers to these officers were earned by purely professional work. The first medical officer who attained eminence in a sphere other than professional was John Zephaniah Holwell, Member of Council and temporary Governor of Bengal. But, as the careers of these officers have already been sketched in previous papers,* it would be superfluous to detail them again now.

For half a century after the formation of the Service on 1st January 1764, no medical officer appears to have met with much success in an extra-professional career. In the first twenty years a good many assistant-surgeons drifted into the combatant ranks, but only one appears to have attained to any particular success in his new profession, and he was not of the first rank. *Peter MacGregor Murray* went out to India as an Assistant-Surgeon about 1773, but soon after obtained a combatant commission, and rose to be Adjutant-General of the Bengal Army, in which capacity he is said to have accumulated a fortune of £200,000.† He left India, on retirement from the Service, in 1803, and went home on the Indiaman *Lord Nelson*, which was taken off Ferrol, on 14th August 1803, by the French privateer *Belloae*. Colonel Murray was killed in the hand to-hand-fight which ensued when the privateer boarded the Indiaman. In the same fight fell another I. M. S. officer going home on furlough, Surgeon William Spottiswoode, brother of the Captain of the *Lord Nelson*. The Indiaman was retaken, eleven days later, on 25th August 1803, by the *Colossus* line of battleship.

The most successful of these soldier-surgeons was *Francis Balfour*, who entered the Bengal Army as Assistant-Surgeon on 3rd July 1769, was appointed Ensign eight days later, 11th July 1769, became Lieutenant on 26th June 1771, and on 10th August 1777 reverted to the Medical Department on receiving promotion to the rank of Surgeon. He was lucky in promotion throughout, becoming a member of the Medical Board on 20th December 1787, with only eighteen years' service, and holding that appointment for nearly twenty years, till he retired on 16th September 1807. He lived at least ten years longer. He was a voluminous author, his best-known work being "A Treatise on Sol-Lunar Influence in Fevers," which went through four editions (1784, 1795, 1815, 1816), and was translated into German in 1786. He was for some time Surgeon to Warren Hastings.

Charles Chaston Assey (entered the Service 19th September 1799) was for three years, 1814-1817, Chief Secretary to the Government of Java, while that island was in British possession. He died in Fort William on 21st March 1821.

John Crawfurd (entered 24th May 1803), was one of the most successful of the I. M. S. officers who have adopted a political career. In 1808 he was posted to Penang, and in 1811 accompanied the expedition to Java, which resulted in the reduction of that island. For the next six years, 1811 to 1817, he was in political employment in Java. From 1817 to 1820 he was on furlough, and from 1820 to 1823 was at the head of an Embassy from the Company to the Courts of Siam and Cochin-China. In 1823 he succeeded Sir Stamford Raffles as Administrator of Singapur, and held that appointment till 1826, when he went on an embassy to the Court of Ava. He retired on 12th July 1827, when holding the post of Civil Commissioner, Pegu; and lived at home for over forty years, dying at his house in South Kensington on 11th May 1868. He was elected a Fellow of the Royal Society on 7th May 1818. Crawfurd wrote several books on the countries of Further India, which were for long the recognised authorities on the subject: "History of the Indian Archipelago," 3 vols., 1820; "Account of an Embassy to Siam and Cochin-China," 1828; "Journal of Embassy to the Court of Ava," 1829; "Grammar and Dictionary of the Malay Language," 1852; and "A Descriptive Dictionary of the Indian Islands," 1856.

John Leyden, the next name in chronological order, was one of the most talented men who ever came to India. Born at Denholm in Roxburgh on 8th September 1775, he was at Edinburgh University from 1790 to 1797. In May 1798 he was licensed as a preacher at St. Andrews, by the Church of Scotland, and presumably was the only clergyman who ever entered the Indian Medical Service, though a few men have been ordained after retirement. Not proving successful as a preacher, he turned his attention to literature, helping Sir Walter Scott with his "Border Minstrelsy," and editing "Scottish descriptive poems," and the "Scots Magazine" in 1802. In the same year he was offered an appointment as Assistant-Surgeon in the Madras Army, contingent on his getting a medical qualification, and succeeded in getting the degree of M. D. of St. Andrews University, as well as the diploma of L. R. C. S., Edinburgh, within six months, towards the end of 1802. He landed in Madras on 19th August 1803. The next three years he spent chiefly in travelling, in Mysore, Cochin, Malabar, and Penang. He was appointed Professor of Hindustani, in the College of Fort William, in 1806, Judge of the 24-Parganas about January 1807, and in January 1809 Commissioner of the Court of Requests, Calcutta. At the end of 1810 he was appointed Assay Master of the Calcutta Mint, but in 1811 went with the expedition for the reduction of Java, and died at Cornelis, Batavia, on 28th

* *I. M. G.*, January and February 1901, January and February 1902.

† *Gentleman's Magazine*, September 1803, pp. 834, 867.

August 1811, of a fever contracted while examining oriental manuscripts in a damp ill-ventilated library. He died at the early age of 35, leaving a reputation as one of the most deeply versed oriental scholars who ever served in the country. In his day, also he had considerable reputation as a poet, though few have read "The Scenes of Infancy," in the present generation. One of his works "Journal of a Tour in the Highlands" was published so recently as 1903.

John Macneill, the next name on our list, was even better known in his day than Crawfurd or Leyden, attaining to much greater worldly success than either of them; in some ways, indeed, greater success than any other man in the I. M. S., having been an Ambassador, G. C. B., and a Privy Councillor. No other I. M. S. officer has attained to either of the first two dignities; Joseph Hume is the only other man who has attained to the third. John Macneill was born at Colonsay on 12th August 1795, and he died at Edinburgh, where he took the degree of M. D. in 1814, at the age of 19, and entered the Bombay Army as Assistant-Surgeon on 6th September 1816. In 1818-19 he served in the field force under Colonel East in Cutch and Okamandal, afterwards becoming Deputy Medical Storekeeper. He became Surgeon on 1st May 1824, and from 1824 to 1835 was attached to the E. I. Company's Legation in Persia, first as medical officer, then as political assistant. On 30th June 1835 he was appointed Secretary to the special Embassy sent to Teheran, under Sir Henry Ellis, to congratulate Muhamad Shah on his accession to the Persian throne. At the same time the Persian Legation was handed over by the E. I. Company to the Foreign Office. The first class of the Persian order of the Lion and Sun was conferred on Macneill in 1835; on 9th February 1836 he was appointed Minister Plenipotentiary to Persia. In 1838 he was present in the Persian camp, at the siege of Herat, from 6th April to 7th June. In 1839 he was created a G. C. B. (civil), and left Persia for good on 15th August 1842. In 1845 he was appointed Chairman of the Board of Supervision of the working of the Scottish Poor Law Act of 1845 and held this post till 1878. In 1855 Sir John Macneill and Colonel Sir Alexander Murray Tulloch were sent to the Crimea as Special Commissioners to inquire into the working of the Commissariat. Macneill was elected F. R. S. on 5th April 1838, was made a Privy Councillor in 1857; he was also D. C. L., Oxford, and LL. D., Edinburgh. He died at Cannes on 17th May 1883.

John Stephens entered the Bengal Army as Assistant-Surgeon on 17th September 1806, and became Surgeon on 7th October 1818. He was serving as Assistant to the officer in charge of the then newly-ceded territories of Narbada and Sagar, when he was murdered in court, at Seoni, on 17th August 1827.

James Morton entered 16th March 1820, and became Surgeon on 7th May 1831. He served for many years in the Arakan Commission, and died at Kyukphyu on 24th June 1845, while holding the appointment of Senior Assistant Commissioner of Arakan.

Archibald Campbell entered the Service on 8th May 1827 and became Surgeon on 16th January 1844. He held the appointment of Superintendent of Darjiling from 1840 till his retirement on 8th Feburary 1862. When touring in Sikkim with Sir Joseph Hooker, they were seized by the Diwan of the Sikkim Raja, on 7th November 1849, and kept in confinement at Tumloong till 9th December. Campbell was subjected to considerable indignities and ill-treatment, but Hooker was not molested, and indeed would have been allowed to go, but refused to abandon Campbell. On 9th December they were allowed to start for Darjiling, under the Diwan's escort as far as the Rangit, and reached Darjiling on 24th December. As a result of this outrage, the Government of India annexed the Sikkim Tarai, and the hills up to the great Rangit River, and also stopped the annual subsidy of Rs. 3,000, formerly paid to the Sikkim Raja as rent for the site of Darjiling.

John Spencer Login entered the Bengal Medical Service on 5th March 1832, becoming Surgeon on 17th April 1848. He served in the First Afghan War, and was with D'Arcy Todd at Herat in 1839-40. He was then for some time Residency Surgeon at Lucknow, served in the Punjab Campaign of 1848-49, and on the annexation of the Punjab became Postmaster-General of the new province. Soon after he was appointed guardian and tutor to the Maharaja Dulip Sinh, the late King of the Punjab, and held that post from 1849 to 1858, when his ward came of age. He was knighted in November 1854; retired, after spending several years in England in charge of Dulip Sinh, on 15th April 1858, and died at Felixstowe on 18th October 1863.

Percival Barton Lord entered the Bombay Medical Service on 23rd November 1834. In 1836 he accompanied Captain, afterwards Sir Alexander, Burnes on his commercial mission to Kabul, and visited Kunduz in 1837. When the Government of India determined to restore Shah Shuja to the throne of Kabul, in 1839, Lord was appointed one of the Political Assistants to Sir William Macnaughten, the Chief Political Officer. Lord came up to Kabul with the force from Peshawar, under Colonel Wade, in July 1839, and served as A.-D.-C. to Wade at the forcing of the Khyber Pass. He was then posted as Political Agent to Kunduz, in Afghan Turkestan, and passed the winter of 1839-40 in the caves of Bamian. He was killed on 2nd November 1840, at the battle of Parwandara, where Dost Mahomed defeated Shah Shuja's forces.

James Neil Dryburgh Login, a younger brother of Sir John Login entered the Bengal Service on 6th May 1842. He served in the Sutlej

Campaign of 1845-46, after which he was appointed medical officer, and subsequently Political Assistant to the Resident in Nepal. While holding that post he died of cholera at Dinapore on 13th November 1849.

Hugh Francis Clarke Cleghorn entered the Madras Medical Service in 1842. He served in the Mysore Commission for some years, was on furlough from 1848 to 1851, and on his return became Professor of Botany and Materia Medica in the Madras Medical College. In 1855 he became Conservator of Forests in Madras, a post which he held till 1867, when he was appointed to officiate as Inspector-General of the Forest Department. He retired in 1869.

Charles Hathaway entered the Bengal Army on 10th August 1843, became Surgeon on 27th June 1857, and Surgeon-Major on 10th August 1863. He was for many years Civil Surgeon of Lahore, and subsequently Inspector-General of Gaols in the Punjab; but was best known as Private Secretary to Lord Lawrence, during his tenure of the office of Governor-General. He retired 14th February 1866, and is still alive, nearly forty years later.

Arthur Young entered the Bengal Service on 20th October 1853, becoming Surgeon on 4th October 1864. He served in the Oudh Commission till his retirement on 26th March 1872, and is still alive.

John Lindsay Stewart became Assistant-Surgeon, Bengal, on 4th August 1855, and Surgeon on 4th August 1867. He served in the Mutiny, being present at the siege of Delhi. In 1860-61 he officiated for Dr. Jameson as Superintendent of the Saharanpur Botanical Gardens, and in 1864 was appointed Conservator of Forests in the Punjab; a post which he held, with an interval on furlough in 1869-71, till his death, which took place at Dalhousie on 5th July 1873.

William Henry Hayes also entered on 4th August 1855, and became Surgeon on 4th August 1867. After twenty years' service in the Bengal Commission, chiefly in the Sinhbhum District, he retired on 16th April 1878, and is still alive.

Henry Walter Bellew, after serving in the Crimea, entered the Bengal Medical Service on 14th November 1855, and soon made a name for himself as an authority on the language, manners, and customs, of the Afghans, and as a traveller. During the Mutiny he was with the Lumsdens at Kandahar; in 1871 he accompanied Sir R. Pollock's Mission to Seistan, and in 1873 went with Sir Douglas Forsyth to Kashgar and Yarkand. He was made a C.S.I. in 1873. In 1879-80 he served in the Afghan War as Chief Political Officer at Kabul, but had to return home on account of ill health. The last appointment he held in India was that of Sanitary Commissioner of the Punjab. He retired on 14th November 1886, and died on 26th July 1892.

As we have now, in our survey, come down almost to the present day, a brief notice will suffice for those officers who have served in political employ at a later date. *J. P. Stratton*, of the Bombay Medical Service, spent most of his service in the Political Department, and was for many years Resident at Jaipur. *Sir Alfred Lethbridge*, after nearly twenty years as Inspector-General of Jails, Bengal, became Superintendent of the Thagi and Dakaiti Department, from April 1892 till his retirement on 1st April 1898. *Oliver Thomas Duke*, after serving as medical officer to the Beluchistan Political Agency for some years, became a Political Agent in the same Province. Since his retirement on 22nd February 1887, he has thrice unsuccessfully contested South Bedfordshire in the Unionist interest. *Sir George Robertson*, the explorer of Kafiristan and defender of Chitral, retired so recently as 22nd October 1899, and in 1900 unsuccessfully contested Stirlingshire as a Radical.

A few lines may be devoted to mentioning some medical officers not in the I. M. S., who have won distinction during the last half century as diplomatists or administrators. Sir John Kirke was Consul-General at Zanzibar; Sir Rutherford Alcock was Consul-General in Japan from 1858 to 1862, and Minister Plenipotentiary at Pekin from 1865 to 1871. Sir Samuel Rowe, of the Army Medical Department, was Governor successively of the Gambia, of the West African Settlements, and of the Gold Coast and Lagos. Sir William MacGregor, first a Colonial Surgeon, subsequently Administrator of British New Guinea, Governor of Fiji, and Governor of Lagos. Leander Starr Jameson is best known as the leader of the famous raid on Johannesburg.

Last, but not least, we may allude to Leonard Wood, Assistant-Surgeon in the United States Army, who, in the late Spanish-American War, developed into a Brigadier-General, and subsequently became Governor-General of Cuba. An incident in his career goes to show that red tape may flourish as rigorously under the "Bird O' Freedom Soarin" of young America, as under the effete old British Lion. While Wood was Governor-General of Cuba some official discovered that he had never passed the examination for promotion from Assistant Surgeon to Surgeon, and gravely proposed that he should be recalled to the States for the purpose.

RESISTING POWERS OF THE LARVÆ OF CULICIDÆ TO DESICCATION.

BY E. JENNINGS,

MAJOR, I.M.S.,

Bareilly.

IN April, 1901, I took up the subject as to how mosquitoes, especially culex, (as I am glad to say anopheles are scarce here,) tide over the different seasonal periods inimical to their breeding. I started with eggs, and carried out innumerable experiments in order to see if eggs

removed from water could be placed in such surroundings, that after a time on being replaced in water they would hatch out. I found after all my experiments that eggs removed from water for 24 or 36 hours in no case hatched out. This has led me to believe that the different periods are not tided over by eggs. One of my experiments was to place eggs on dry mud taken from a small tank. The mud was put in a small glass vessel, the eggs placed on the mud, and water was then poured into the glass vessel. After two hours I found on looking into the water four or five larvæ. Although the eggs did not hatch, this at the time did not strike me as being important, since I thought these larvæ seen were in the water which I had taken from a tub in my bathroom.

At the end of April I went home on leave, and so did not carry on any more experiments, although I had satisfied myself that eggs must be put out of court. On returning in July this year I made several experiments with larvæ, which I need not repeat here as they were failures. On reading through my notes I came across the remark that "there were four or five larvæ in glass vessel which contained tank mud on which eggs had been placed." This struck me as being worth while to repeat, but with certain precautions, *viz.*, to use filtered water. In my garden is a small shallow brick tank, the size being 2′ × 2′ × 6″ The tank is in the sun. I examined it and found a certain amount of mud and dead leaves at the bottom. There was about one inch of water, and it swarmed with larvæ of culex of various ages, also nymphæ and eggs. This was on the 18th of August. On the 21st the tank was dry and the mud quite dry. I scraped up the whole of this mud and put it into a box. On the 21st I put some of this dry mud into a small glass vase along with filtered water. Two hours after I found two larvæ. Some of this mud I put into water every day till September 3rd, when I put it in every other day till the 23rd of September, with the results given in the Table below. On the 28th August, 1st September and 21st September the results were *nil*. This may have been due to no larvæ being in the mud, or to their having died; anyhow it made no difference, as on subsequent days larvæ appeared. A month after, *viz.*, 23rd October, I again put some of the dry mud into water, and found larvæ in the water six hours after. The water being much colder in October, hence the delay in the larvæ being resuscitated. The last of this mud I placed in water on November 16th, and found two larvæ after seven hours. I have some other mud which has now been two months perfectly dry, and which gives me good results on being placed in water. From this mud I shall continue the experiment. I am certain that if, after complete desiccation, larvæ can be resuscitated after nearly three months, then they will come to life after a much longer period. On referring to the Table, it will be seen that only those larvæ of about two to three days old survive. I have never found any older or any nymphæ, although the water contained larvæ of all ages, also nymphæ and eggs.

In these experiments, it may be said, that the eggs, which were also present, hatched out.

I do not think so for the following reasons:—

1st—Experiments carried out in April 1901 on eggs gave no results.

2nd—I could find no eggs in the mud after being placed in water.

3rd—The size of larvæ were much too large for newly hatched larvæ.

4th The short time in which larvæ appeared in the water.

Everything points to the fact that the larvæ present were not recently hatched. All larvæ ran their usual course and became mosquitoes, as will be seen on referring to Table. On referring to Giles' excellent book on Gnats and Mosquitoes, second edition, page 123, the following will be found:—"Desiccation, on the other hand, was better borne by the nymphæ, which in a few days were transformed into very active mosquitoes, in spite of being placed in dry river sands, so that a drying up of a pool does not stop the development of such insects as have reached this stage, while the larvæ were all dead in two days if dried at 20C., and both stages were killed by two minutes' exposure to a temperature of 40C. Experimenting in India I found that larvæ were usually dead and decomposed before the mud of the pool in which they had lived had dried up by ordinary evaporation."

In my experiments I found that all larvæ over three days old or thereabouts did not revive—in fact all my first experiments ended in failure, as I had experimented on larvæ of six, seven or eight days old. I also find that they do not survive in mud taken from every tank. I am now experimenting as to the conditions, *i.e.*, to ascertain if the water has to be rapidly evaporated in the sun, or out of the sun. Time of year:—The experiment in 1901 was in April before the rains, and the one in August after the rains. Season may have something to do with it. No nymphæ have ever survived in my experiments; but in future experiments they may prove to do so. The facts which I have up to date verified are:—That Culex larvæ of a certain age can survive after nearly three months' complete desiccation. No nymphæ or eggs have survived after desiccation. The larvæ that have been resuscitated run the usual course and become mosquitoes. If this is true for culex, I am almost sure that the same will hold good for anopheles, in fact, in one of my experiments on anopheles larvæ I believe that they did survive. The experiment was not completed, as an accident happened to the glass vessel, a rat having knocked it over.

I have not been able to carry out any more experiments with anopheles because, with the

exception of one small puddle under a tree which contained anopheles, I have not been able to find any larvæ for some distance around, but I hope that those more unfortunate who have pools with anopheles in them might repeat my experiment. I hope later to send you a method by which, if I may use the phrase, larvæ can by artificial means be desiccated. I am now working on this. I find that a shallow brick tank with the usual mud and leaves at the bottom, the tank being in the sun, is the best place to take the mud from. The mud when quite dry is scraped up and put into a card-board box. A small glass vase in which water has been placed is best. I take some of the dry mud and drop it on the water, this floats at first and then gradually drops to the bottom; from two to eight hours after, according to the temperature of the water, the larvæ can be seen swimming about. I find at Bareilly that tanks and certain shallow puddles contain water up to the beginning of April, during which time culex can be found. Larvæ, nymphæ and eggs are to be found in these tanks and puddles, but from April to the middle of June, or till the rains break, mosquitoes are not seen. There are no tanks or puddles, water being taken from wells. It is this period which mosquitoes have to tide over. In my experiment on eggs in April 1901 I found larvæ in the mud, though this is open to doubt, *viz.*, that they may have been introduced into the glass vessel from water taken from my tub, but from recent experiments I believe myself they were in the dry mud. My experiments, as far as I am aware, were carefully carried out, and errors guarded against; so it can be taken that larvæ of culex can survive three months' complete desiccation. This would easily tide over the period of April, May, and June in Bareilly, when water on the surface is very scarce, and I have no doubt that the period of desiccation can be considerably prolonged and the larvæ survive.

I believe this is the only method by which culex tide over periods inimical to their breeding. I have kept mosquitoes, and have tried various methods to prolong their lives; but 20 to 30 days is the longest I have been able to keep them alive, without food or water eight days. Now during the hot weather, at least in Bareilly, *viz.*, April, May and June, a mosquito is very rare, in fact I have not seen one. If they are present, what do they live on? Green vegetation is scarce, at least what one would expect a mosquito to eat. How can they then survive the three months in which water and food, I might say, are absent? I am still working at experiments to find if it is possible to keep a mosquito alive without food or water. I find if kept in the dark, they live longer than if exposed to light. It may be that mosquitoes breed in April, may have the power of hibernating, and doing without food or water; if not, I do not see how they can survive, especially in the Punjaub, where food, except animal, is more scarce than in the Upper Provinces. If they prolonged their lives on animal food, why are they not seen and felt? Eight days is the longest period I have been able to keep a mosquito alive without food or water. Under favourable conditions, from twenty to thirty days. In Bareilly I have found culex in all months except April, May and June, and it is during these months, when food for the mosquitoes, and water for eggs, larvæ, and nymphæ is absent, that the power of the larvæ of a certain age to survive dessication enables them to tide over the period during which they would become extinct.

Table giving date in which dry mud was put into water, with number of hours after which larvæ appeared, their apparent age; date on which nymphæ and mosquito appeared.

Month and date.	Hours after mud was put in water that Larvæ appeared.	Age of larvæ about	Date on which nymphæ appeared.	Date on which mosquitoes appeared.
21-8-03	Two ..	2 to 3 days	25-8-03	27-8-03
22-8-03	Four ..	2 to 3 ,,	26-8-03	28-8-03
23-8-03	Two ..	2 to 3 ,,	27-8-03	28-8-03
24-8-03	Four ..	2 to 3 ,,	28, 29-8-03	29, 30-8-03
25-8-03	Three ..	2 to 3 ,,	29, 30-8-03	30, 31-8-03
26-8-03	Five ..	2 to 3 ,,	30, 31-8-03 1-8-03	31-8-03 and 1,3-9-03
27-8-03	Six ..	1 to 2 ,,	31-8-03 and 1-9-03	1,2,3,-9-03
28-8-03	*Nil* ..	*Nil*	*Nil*	*Nil*
29-8-03	Two ..	1 to 3 ,,	1, 2-9-03	2, 3, 4-9-03
30-8-03	Three ..	2 to 3 ,,	2-9-03	2, 3, 4-9-03
31-8-03	Three ..	2 to 3 ,,	3, 5-9-03	5, 7-9-03
1-9-03	*Nil* ..	*Nil*	*Nil*	*Nil*
2-9-03	Four ..	2 to 3 ,,	4-9-03	6-9-03
3-9-03	Five ..	2 to 3 ,,	6, 7-9-03	7, 8-9-03
5-9-03	Three ..	1 to 2 ,,	12, 13-9 03	13, 14-9-03
7-9-03	Two ..	1 to 2 ,,	12, 13, 14, 16-9-03	13, 14, 15, 16-9-03
9-9-03	Two ..	1 to 2 ,,	13, 14-9-03	14, 15-9-03
11-9-03	Two ..	1 to 2 ,,	16, 20, 22-9-03	17, 22, 28-9-03
13-9-03	Larvæ	found dead	*Nil*	*Nil*
15-9-03	Two ..	1 to 2 days	18-9-03	20-9-03
17 9-03	Four ..	2 to 3 ,,	20-9-03	22-9-03
19-9-03	Two ..	2 to 3 ,,	22-9-03	24-9-03
21-9-03	*Nil* ..	1 to 2 ,,	*Nil*	*Nil*
23-9-03	Six ..	2 to 3 ,,	26-9-03	28-9-03

MALARIA: AS SEEN IN THE ANDAMANS PENAL SETTLEMENT.

BY ERNEST E. WATERS, M.B. (EDIN.),

CAPTAIN, I.M.S.,

Officiating S. M. O., Port Blair.

(Continued from page 448.)

THEY breed usually in stagnant pools containing vegetable débris, such as hollows in trunks of trees. This species wanders further from its breeding places than culex does, and is often found where there is no possible breeding place and where C. Fatigans disappears.

Only one variety of anopheles is known here, the A. Rossii, and that has been found only in two places. The breeding-place they affected was a series of borrow pits excavated during the building of a convict barrack. This variety was also discovered at Dundas Point. Except when these borrow pits were in existence, it was impossible to find any anopheles larvæ on Ross Island.

Another mosquito, of the sub-family Panoplites, has also been caught, but only in small numbers. Of Corethra three varieties were discovered, one of which breeds largely in the Ross drinking water tank and is the only larva to be found there.

These Corethræ appear to have no biting apparatus, and therefore can hardly be said to be carriers of infection. One variety has not hitherto been described, and appears to be a new one discovered by Mr. Lowis.

On the whole, mosquito brigades are of distinct benefit; for some unexplained reason they have not succeeded this season in Ross and Aberdeen, but in the other districts the results are encouraging. Undoubtedly the stations are much cleaner and the number of mosquitoes less, but they are far from being exterminated; they no longer flourish in the fire barrels or in the immediate vicinity of barracks, but except in very small or special areas, or where there is enthusiastic European supervision, these pests will remain and continue to carry infection.

2. *The prevention of infection by the use of nets, etc.*

At first sight this appears to be the remedy offering the best prospects. We know that a net will keep off mosquitoes, and we also know, from fifteen months' steady observation in the Female Jail, that persons sleeping under a net have only one-fourth the risk of malaria that unprotected people have, and when attacked with fever are a shorter time in hospital. The cost, too, of mosquito netting is comparatively little. Why not then introduce it?

The great drawback to netting is its interference with ventilation. Even under an ordinary mosquito net the difference in the freshness of the air inside and outside is quite marked, and this is equally the case with a larger net containing twenty or thirty people. The women in the jail complain much of the heat under the net, and it is absolutely certain that if nets are to be taken into general use as malaria guards the amount of cubic space per head must be very considerably increased, for there is practically no movement of air through the meshes of a thick net.

The question is of much importance owing to the prevalence of phthisis, and one is confronted by two precisely opposite problems. To check malaria in this way one must put up nets to exclude mosquitoes, and consequently seriously interfere with the air supply. On the other hand, to check phthisis, we must have better ventilation, more air and more superficial space. Which is the better? I think the balance is in favour of more space and more air, combined with measures to be presently discussed.

3. *The effective dosage of the whole population with quinine.*

This procedure is strongly recommended by many authorities, more especially by the Italian observers and by Koch. The theory is that the administration of one gramme of quinine daily for two successive days, and the repetition of this every week will check the occurrence of malaria by inhibiting the growth of parasites. The local opinion is against this theory, but quinine had never been given in sufficiently large doses, nor had the distribution been made on sufficiently systematic lines. Naturally, over a district comprising 130 square miles of country, and populated by men of very varying occupations, who cannot always be caught at meal or other parades, the issue of quinine regularly is a very difficult matter.

Major Anderson's experiments shewed that small doses of quinine such as 2½ to 5 grains daily had absolutely no effect on the malarial admissions of the Female Jail, but that the effects of large doses were more favourable. Longer observation has confirmed this view. Twenty grains of quinine twice weekly have halved the admissions for malaria, but the remedy is not a specific.

During the malarial outbreak last year, I directed that a further experiment should be made at Bindrabun, probably the most malarious place in the Settlement, but the results were most disappointing so far as this station goes.

One hundred and twenty men were taken and their names recorded. To the even numbers 20 grains of quinine were given on two successive days, to the odd numbers nothing. The results were as follows :—

	JUNE.		JULY.		AUGUST.	
	Quinine.	No quinine.	Quinine.	No quinine.	Quinine.	No quinine.
Admissions	42	42	31	33	21	22

Average stay in hospital. Quinine. 5·56 days. No Quinine, 5·60 days.

After August the special experiment was discontinued.

In June last an attempt was made to check the malaria by an issue of 10 grains of quinine to every convict on two successive days, repeated weekly. With the help of the executive authorities diaries were arranged, and parades organised. Compounders accompanied by Petty Officers were sent round the districts and instructed. Each man had his route and times marked out for him, so that all concerned knew what arrangements to make. In the larger stations private servants, boatmen, and others in special employ were attended to by travelling compounders, who visited the different houses and so avoided the inconvenience of such men having to attend parades or hospital. This prophylactic issue lasted from June 16th to December 1st. Some details are appended.

Altogether 496,501 doses (each of 10 grains) were issued, and about 650 lbs. of quinine expended. Over the whole period of five months more than 80 per cent. of the population were

receiving this drug, but the results were nothing like what they theoretically should have been, nor were they consistent.

Thus— ROSS.

Average admissions July to December inclusive:
(2 years no quinine) 150
Admissions with quinine 1902 ... 236

ABERDEEN.

Average admissions July to November:
(2 years no quinine) 960
Admissions with quinine, 1902 ... 922
Some 300 increase in strength of station.

HADDO.

Average admissions, July to November:
(2 years no quinine) 818
Admissions with quinine, 1902 877
Some increase in strength of station.

SOUTHERN DISTRICT.

Average admissions, July to November:
(3 years no quinine) 1,234
Admissions with quinine, 1902 1,372
Considerable increase in strength in Southern District.

WIMBERLEY GANJ.

Average fever admissions, July to November:
(2 years no quinine) 1,671
Admissions with quinine, 1902 1,759
Considerable increase in strength of station, so that fever admission rate per mille of strength is lower.

FEMALE JAIL.

Total fever admissions 15 months—
(*a*) receiving quinine 362
Average stay in hospital 5·5 days.
(*b*) not receiving quinine 695
Average stay in hospital 7·35 days.
Strength of each class nearly the same.

At first sight it would appear that the issue of quinine has done little or no good, or at most that the results have been inconclusive. But 1902 was a particularly unhealthy year, and it may fairly be assumed that but for the quinine the malarial admissions would have been even higher than they were. Thus in the two unhealthy districts (Southern District and Wimberley Ganj) the fever admissions in the pre-quinine period of 1902 were very much higher than in previous years, whilst after quinine was given, the figures assimilate very closely.

SOUTHERN DISTRICT.

No quinine.

Three years average malarial admissions January to June inclusive	1,983	Average, July to November ...	1,234
Malarial admissions, same period 1902, no quinine ..	2,938	Same period 1902. with quinine ...	1,374
Increase in admissions in 1902	955		142

WIMBERLEY GANJ.

2 years average malarial admissions, January to June inclusive ...	2,149	Average, July to November ...	1,671
Malarial admissions, same period 1902, no quinine ...	2,668	Same period 1902, with quinine ...	1,739
Increase in admissions in 1902	519		88

Thus quinine seems to have brought the very unhealthy year back to the level of the previous ones, although the population has increased.

It is possible that the prevalent type of malarial parasite is largely responsible for the inefficacy of quinine as a prophylactic. One of the commonest parasites is the malignant tertian, and this, as is well known, is particularly resistant to quinine.

This fact, with the known frequency of malignant crescents existing without fever or symptoms, has an important bearing on malarial prophylaxis.

4. *The keeping of the whole population "fit" by guarding them from unnecessary exposure and cold.*

This suggestion has been already discussed above under the relapse theory, and little more requires to be said.

It is obvious that the better general health our men are in, the less likely they will be to succumb to malaria or other disease. But here the great difficulty is the interference with discipline and with the work of the administration.

If labour in swamps, forests and brickfields is prohibited, if work is to stop at every shower of rain, then I do not doubt that the sickness will decrease, but it does not appear advisable to recommend any such procedure or to attempt to interfere with necessary forms of convict labour in the Settlement.

Apart from any such steps we may improve the cooking and food supply, we may introduce drying rooms, issue extra clothes and so ensure that the convict shall have dry things to sleep in. Sanitation, air space, and so on can be attended to, and an occasional extra ration may be issued when the labour is excessively trying or hard.

With this object in view it is proposed to utilise the Aberdeen drying room for one particular section of convicts during the coming wet season, to make such arrangements as will ensure dry clothes to them and possibly to make special arrangements about their food. Contrasting with these there will be another section doing the same work, living in the next barrack, but not receiving the special advantage of dry clothes. The results will be of great interest and will be carefully noted.

I have detailed above the four principal methods in which we may combat malaria; it is now necessary to discuss their relative merits and practicability.

It has been pointed out that, as far as actual admissions go, the mosquito net undoubtedly has the best effect, especially in the case of

women living under jail conditions, not doing hard out-door labour or exposed to rain and storm. But the ventilation difficulty is insuperable unless a very much larger amount of cubic space is provided—a larger amount than one could justly recommend.

We are left, then, with mosquito brigades, prophylactic quinine and general sanitation, and it is to these that we must look as means of checking malaria. I have endeavoured to shew that the two former have already had some good effect. It is not unreasonable to hope that as experience is gained in the working of the mosquite brigades, better results may be hoped for. The prophylactic issue did do good, and, I think, not only by diminishing the admissions, but over the whole Settlement by lessening the periods of detention in hospital. This opinion is supported by the various medical officers in charge of the Settlement hospitals, especially in the female jail (q. v.).

For general sanitation we must rely largely on the executive officers in immediate charge of the convicts. It is to their interest to have a low sick rate, for the fewer men they have in hospital the more easily can remunerative work be undertaken.

In conclusion I advocate the following measures as the most suitable for the checking of malaria:

1. The retention and, when necessary, expansion of the existing mosquito brigades. The expert trained part of each gang should be permanent and not available for other work. The coolies, drain makers, &c., may of course be taken on and off as required, but the Petty Officer of the gang who knows what a mosquito larva is like, who can recognise culex eggs and knows the usual hiding and breeding places of the insects should be a fixture.

2. The general administration of quinine throughout the Settlement in prophylactic doses.

3. The establishment in the outlying and unhealthy stations of branch dispensaries supplied with quinine and simple remedies. This plan was tried last year with much success, both in the treatment of malaria and also of dysentery. It at times enabled us to get hold of patients earlier than we otherwise should have done and to save invaluable time in treatment.

So far we are hampered by want of an adequate Medical and Compounder staff, but it is hoped that more assistance will soon be available.

4. The provision of drying rooms or drying frames at every station, and as a corollary the issue of extra clothing.

I do not regard the drying room as a panacea for all evils, but I am sure that giving a man dry clothes to sleep in and a good, hot, well-cooked meal, when he comes home from work, will enable him much more successfully to fight against malaria and other climatic diseases.

5. The restriction of such unhealthy forms of labour as firewood cutting, swamp work, &c., to the narrowest limits, and the granting to men so employed of a small extra food ration. I regard the proposed substitution of coal for firewood as a most valuable idea, and one which cannot but have a good effect on the general health.

6. The continual stimulation of local public interest in the health of the convicts. One would like to see competition between stations as to which should have the lowest sick and death-rates and whose malarial admissions should be fewest.

I should like to add a few remarks on the clinical characters of the malaria as locally observed, and on the various methods of treatment in use.

Owing to the nomenclature adopted by the Royal College of Physicians, we are obliged to define our malaria cases as remittent or intermittent fever. This is a most unsatisfactory classification; many cases are remittent (in the sense that the temperature does not touch normal) for the first two or three days and then assume an intermittent type for a longer period. Such a case may recover and be returned under either heading according to the ideas of the Medical Officer in charge of the case. On the other hand, such a case may die after a stay of some weeks in hospital, during the latter part of which stay the temperature may have been normal, intermittent or even subnormal at times. Yet that case may reasonably be shown as remittent fever by one man and as intermittent fever by another.

In the Port Blair returns "remittent fever" may be taken to mean a severe type of malarial fever, and all cases dying from remittent fever are considered as malarial.

These 'remittent' cases occur in all parts of the Settlement, but especially in the less cleared areas like the Wimberley Ganj and Viper Sub-Division. 148 cases with 48 deaths were thus returned in 1902.

Many of the cases are rapidly fatal, the patients often being brought to hospital in a dying condition. Three or four days is a very common period for the patient to survive, and delirium and coma are frequent before death. Hyperpyrexia is not common, though in one fatal case a temperature of 110° was noted, and in another non-fatal case one of 107°.

The men attacked are often old malarial subjects who have many previous admissions for the disease; one patient had 24 previous admissions recorded, others had 15, 12, 10, and so on.

Malarial parasites are occasionally but not often found. As is well known in these pernicious cases, parasites are often absent from the peripheral circulation.

On *post-mortem* examination, the outstanding features are the general congestion of the organs, especially of the brain and its membranes, the

abundance of cerebro-spinal fluid, and the enlargement of the liver and spleen. The latter in 29 examinations averaged 22 ounces in weight, whilst the liver was frequently well over 70 ounces.

These cases coincide very closely with those described by Pewintzky of St. Petersburg in his essay on Pernicious Swamp Fever. (*Journal of Tropical Medicine*, July 1902).

The possibility of some of these cases being cerebro-spinal fever was considered, but no definite evidence of this disease was obtained, either clinically or microscopically.

Some of these remittent cases yield readily to treatment, but others are most intractable. Hypodermic injections of quinine are freely given, in some cases with much benefit, only rarely with none. Large doses of quinine by the mouth and by the rectum have also been tried. Methylene blue acts well in some obstinate cases. Latterly we have been giving "mass doses" of 30 grains of quinine by the mouth or hypodermically, and in most cases with good effect. Often the temperature falls at once and remains down. In no case have we noticed ill-effects from these large doses, nor is hæmaglobinuria known.

An attempt is now made to examine microscopically the blood of every patient who comes to hospital complaining of fever, and in this way the blood of 4,304 patients has been searched. In many cases two, three or even more examinations were made.

Parasites were found in 2,338 cases. The chief varieties noted are:—

Intracellular hyaline, 776 cases; hyaline ring form (malignant tertian), 438 cases; pigmented intracellular, 704 cases; pigmented extracellular, 273 cases; crescents, 123 cases; segmenting forms, 20 cases; and flagellæ, 2 cases.

More attention was paid to the presence or absence of parasites than to the particular variety, but it is interesting to note that quartan parasites were far from rare, and would often resist quinine for some days.

It has been stated (Report of Royal Society's Malaria Commission) that native children frequently harbour parasites without symptoms or rise of temperature. This I can partly confirm. Many children in whose blood we found parasites said they were perfectly well, but on investigation were found to be suffering from fever or from enlarged spleens.

For example, *all* the children in the Female Jail and attending the Aberdeen School were examined:

Number of children, 158; parasites found in 58 cases; of these on examination, 40 had fever or enlarged spleen; whilst 18 had no fever.

Varieties of parasites:—

Intracellular hyaline, 22 cases; intracellular pigmented, 23 cases; extracellular, 10 cases, and crescents, 2 cases.

Again at Haddo, 68 healthy-looking persons (including Andamanese adults and children, school children, &c.), were examined. Parasites were found in 11 cases, but all of these on examination were found to be suffering from slight fever.

With regard to the diagnosis of malaria by means of differential blood counts, our results do not altogether agree with those of Rogers. Over 63 counts, and never of less than 500 leucocytes, the average is:

Large mononuclears	14·00
Lymphocytes	25·00
Neutrophiles	59·00
Eosinophiles	5·00
Others	2·00

Rogers claims 15 per cent. of large mononuclears as a diagnostic sign in malaria, but we do not always get such a high percentage.

We have taken specimens in which the crescents were double the large mononuclears, and yet the percentage of the latter was only 14 per cent.

For instance:

Large mononuclears	14 per cent.
Lymphocytes	21·8
Neutrophiles	60·0
Eosinophiles	2·8
Others	1·4
	100·00

Actual count, 501; crescents found, 137; red blood corpuscles, 4,026,000 per c. millimetre; and white blood corpuscles 6,000 per c. millimetre.

On the other hand, in a case of dysentery not complaining of fever, the following count was made:

Large mononuclears	16·3	
Polynuclears	46·9	Total count, 509.
Lymphocytes	34·2	
Eosinophiles	1·0	Crescents present, 58.
Others	1·6	

Here the malarial factor of large mononuclears was present, even though the usual dysenteric increase of lymphocytes was marked.

Altogether, 265 differential blood counts have been made, and many results of considerable clinical interest elucidated.

The convicts that I have trained for microscopical work have been of the greatest use. These men are now well conversant with the different forms of parasites, can make and stain their own preparations, and in some cases can perform differential blood counts.

"LIVER CHILL," AS A FACTOR OF DISEASE IN THE TROPICS.

BY A. E. GRANT,
MAJOR, I.M.S.

(*Continued from p.* 413, *November* 1903).

TAKE the case of a man whose night suit has shrunk to most unsuitable proportions owing, most probably, to the handiwork of the unspeakable *dhobi*. He goes to bed, let us say, comparatively cool and comfortable, but fails to get sound sleep. During the night he tosses, tumbles and becomes bathed in sweat. At dawn a light breeze springs up and lulls him into

what ought to be a refreshing sleep. But, unfortunately, there is by this time a pronounced gap between his upper and nether garments whilst, in addition, both these and the skin are almost saturated with perspiration. If only the abdomen had been covered by the night suit (if of flannel), or by a woollen *Kamr-band* or a folded blanket, he would probably have escaped. As it is, the morning breeze, gentle it may be, but greedy for moisture, produces rapid, but not too rapid (v. *infra*), evaporation from the sodden skin with its continually renewed supply of moisture, by which intense chilling of the external surface is brought about, this, in turn, leading to violent congestion of the portal system —whether directly or reflexly is immaterial to our present purpose—the chief injury falling upon the weakest organ in connection therewith and finding its final expression in an attack of fever, hepatitis, colic and diarrhœa, dysentery, etc. In other cases resulting in very similar attacks, the individual concerned may sleep soundly enough through the night, the determining factor in this case being the intermittent somnolence of the *panka-wala* and the resulting erratic action of the *panka* by which the sleeper is alternately bathed in sweat and chilled.

Take, again, the case of a lady who has been lying down in the afternoon, clad, say, in a thin dressing gown over a cotton or linen nightgown. Originally she lay down cool and dry, and has maintained that condition during her nap thanks to an effectively-pulled *panka*. If she has been wise she has had a light folded blanket placed loosely across the abdomen or has worn a *kamr-band*. At four o'clock, the sun being 'off' that side of the house, the *ayah* comes and opens several of the doors and windows allowing the afternoon breeze to blow freely through the room As soon as the late sleeper rises she loses the benefit of the *panka*, most probably, as the latter is generally hung over the bed, but makes up for this by sitting full in the breeze whilst she sips her hot tea (thus inducing still freer perspiration), and then proceeds to dress leisurely. Here, again, unless reasonable precautions are taken, the same risks are run and results similar to those in the previous case are only too liable to be produced. It may be a small matter that determines the disaster; say, a clammy night-dress which clings to the freely-perspiring body and a dressing gown from which two or three buttons are missing whereby free play of the air currents over the soaking inner garment is permitted. There are of course many other conditions under which a chill may be caused: several of these will be alluded to subsequently.

As said before, if the air is very hot *and* dry, there is little or no danger of chill, for the body is very lightly clad and evaporation is so rapid that both clothes and skin are kept practically dry. It is during weather of this kind that a man may sit with safety under a *panka*, for hours, with nothing on but a bath towel or *loongyi*, or sweat from head to foot at tennis or racquets and 'sit out' till he is dry, without any harm resulting. But it is essential to take care that the conditions are really as above described. Many a man who has been accustomed to do this with safety during the hot weather in the Panjab, Central Provinces or the Deccan, finds out to his cost, when too late, that the attempt to do likewise in the Carnatic, or on the Malabar Coast, or at Bombay or Calcutta, is fraught with grave risk. Only experience can teach the European resident in India to appreciate the conditions under which there is practically no danger of chill: the wise man and woman will take such precautions as are known to be advisable until it is quite certain that these can be relaxed with safety.

There is, I have found, a very prevalent idea that the Natives of India are exempt from the danger of chill. Without discussing the matter at length, it may be asserted that, like many commonly-accepted statements in regard to the dietetic and other habits of Natives generally, this alleged immunity is very far from being absolute. Time and again I have had under my care privately or at the General Hospital, Madras, Natives whose illnesses, especially attacks of malarial fever and dysentery, were, beyond all question, determined by a chill. This was particularly noticeable amongst the students at the various Colleges, *i.e.*, amongst those of them who indulged in games of various kinds. Amongst such, those who, wisely, as I believe, had adopted a flannel shirt, rarely suffered, but of the others who, clad in cotton only, got very warm and perspired freely and then, perhaps, took a drink of water or lemonade and sat for some time with the evening breeze blowing over them, not a few suffered *very* severely, whilst a relatively large number got attacks of malaria, dysentery, etc. It must not be forgotten, also, that the *average* Native, excluding the Coolie class on the one hand, and the wealthy class on the other, leads an extraordinarily methodical, quiet life and but rarely exposes himself to the risk of chill; nay more, it is in the cold season proper that he is specially liable to suffer, from cold not from chill, or when he is transplanted, perforce, to the hills, though one is obliged to admit that those of them who are able to obtain sufficient good food and to dress warmly are very different beings after a few month's residence at 7,000—8,000 feet above sea-level as compared with what they were on the plains.

DIPHTHERIA IN THE MADRAS PRESIDENCY.

BY J. W. CORNWALL, M.A., M.D. (Cantab.),
CAPTAIN, I.M.S.,
Acting Professor of Hygiene and Practical Bacteriology, Madras Medical College.

TILL now there has been a tradition to the effect that diphtheria is a disease that does not

occur in the Madras Presidency. In the month of October I was asked by Major Donovan, I.M.S., to examine a swab from the throat of a suspected case of diphtheria in a European child. No fragments of membrane were visible on the cotton, and film preparations made from the liquid squeezed out of it showed no bacilli in any way resembling those of diphtheria. Inoculation on white of egg, on agar and in broth gave rise to colonies of staphylococci and streptococci only. Blood serum, being a troublesome medium to prepare and one which I do not often require, was not available at the time. Still, diphtheria bacilli, if present in the swab, should have grown on the white of egg, and not finding any merely lent confirmation in my mind to the above-mentioned tradition. The case, nevertheless, Major Donovan informs me, clinically resembled true diphtheria in every respect, and unfortunately ended fatally within a few days.

To be ready, however, in the event of further attacks I obtained a supply of hydrocele fluid, which was collected aseptically in the operating theatre of the General Hospital, and inspissated it after the manner of blood serum at a temperature of 65° C. This gives a beautifully transparent, slightly opalescent medium, on which organisms which prefer serum grow readily. It is moreover obtainable in large quantities and is easily kept sterile from beginning to end, unlike blood brought from a distant slaughter-house. Stock laboratory cultures such as typhoid, Malta fever, Shiga's bacillus and anthrax do not flourish on it, whereas streptococci rhinoscleroma, the Klebs-Loeffler and Hofmann's bacilli grow well. A few days later I received from Major Donovan two other swabs taken from the throat of the English nurse who had been caring for the child, and now began to develop a membranous tonsillitis herself. From these colonies of streptococci, staphylococci, the Klebs-Loeffler and Hofmann's bacilli were obtained on white of egg and the hydrocele slopes. The streptococci were difficult to eliminate, and several days elapsed before a pure culture of the Klebs-Loeffler bacillus could be isolated and sown in alkaline glucose broth to test for the formation of acid. Plate cultures in hydrocele agar were employed.

The significance of the various organisms found in diphtheritic throats has not so far been definitely decided, and it is not yet possible to reconcile the results of equally reliable investigators in different countries. Briefly the present position is this. All observers are agreed that three types of bacilli may be distinguished:

(1) The true Klebs-Loeffler bacillus, which is polymorphic, virulent, acid-forming and shows granules with Neisser's stain.

(2) A bacillus morphologically indistinguishable from (1), which also forms acid in alkaline glucose broth, but is non-virulent. This has been described as an attenuated Klebs-Loeffler bacillus.

(3) Hofmann's bacillus, which somewhat resembles the Klebs-Loeffler in its morphological and cultural aspects, but does not form acid when grown in alkaline glucose broth, is non-virulent and shows no granules with Neisser's stain.

The controversial points are—

(*a*) Is (2) a distinct non-virulent bacillus, or is it at times capable of assuming virulency ?.

(*b*) Does (3) ever give rise to clinical diphtheria in the absence of (1) ?

(*c*) Is (3) invariably distinct from (1) and (2), or can it be transformed under certain conditions into (1) ?

(*d*) Are transitional forms between (1) and (3) met with or not ?

My original culture on white of egg produced the long form of the genuine Klebs-Loeffler bacillus, the beading and clubbing of which were very well displayed by methyl violet. In sub-cultures on hydrocele slopes it quickly became rather shorter and more regular in shape, was often curved and retained the beading. It also exhibited the characteristic blue granules when stained by Neisser's method. It never formed threads, but the bacilli lay side by side or in irregular masses. When thinly distributed V, W and broad arrow figures were frequently noticed. Grown in alkaline glucose broth, it turned the medium strongly acid in 24 hours.

It grew well in ordinary broth, and 1cc. of a 24 hours old broth culture injected subcutaneously was fatal to a guinea-pig weighing 420 grams in 22 hours. Four hours before the animal's death there was distinct œdema and redness over a considerable area round the seat of injection.

Post-mortem. Much fluid was found in both pleural and peritoneal cavities, and the supra-renal bodies were deeply congested and even hæmorrhagic.

There is, therefore, no room for doubting that the nurse was suffering from diphtheria, though it proved to be a mild attack, and contracted it presumably from the child, and that, if suitable media had been ready or further swabs had been taken from the child, the Klebs-Loeffler bacillus would have been recognised in that case also.

Whence the infection came in the first place it is impossible to say. The child had been in Madras for about six weeks and previously to that in Ootacamund. Several of the senior officers of the I. M. S. who have had extended experience both in the hills and in the plains have assured me that they do not remember ever to have seen a case which they have considered clinically to have been undoubted diphtheria. I have myself on previous occasions examined swabs from a few patients in the General Hospital, Madras, but with negative results. Old records are not sufficiently exac

to throw much light upon the matter, and the conclusion is obvious that the disease must have been in the past and must be now quite uncommon.

Records do not help us much even as regards its prevalence in the rest of India, for though cases are reported from Northern India, in none apparently has the diagnosis been confirmed by a reliable bacteriological examination. The only references I can find point to the comparative rarity of diphtheria in Northern India also, unless it happens that officers do not consider such cases worth reporting.

For instance in the *Indian Medical Gazette:*

August 1880.—Greene says that he saw several cases of diphtheria in November 1879 in Serampur.

August 1884.—Norman Chevers states that diphtheria was rather common in and out of Calcutta in his time.

February 1891.—Bose relates the histories of 11 cases in Calcutta Roy asserts that it is met with in hill stations and the N.-W. P. at the end of the rains and beginning of the cold season.

Macleod gives it as his experience that diphtheria is not common in Calcutta.

April 1894.—O'Brien mentions a case in Calcutta.

April 1895.—Crombie describes a case in Calcutta in a person who had just arrived from Bombay. Antitoxin, recovery, no bacteriological examination.

June 1895.—Hansom mentions a case at Poona. Antitoxin, recovery, no bacteriological examination.

July 1901.—Basu records a case at Bankipore. Antitoxin, recovery, no bacteriological examination.

In the annual report of the Sanitary Commissioner with the Government of India diphtheria finds a place in the statistics, but no mention is made of diagnosis or of locality or source of infection.

	1900		1901.	
	Attacks.	Deaths.	Attacks.	Deaths.
European soldiers	3	4	2	..
,, women	1	...	...	...
,, children	7	4	...	...
Sepoys ...	1	1	...	
Prisoners ...	...	...	1	...

Although Major Semple, R.A.M.C., had such things as specimens of malarial blood and tuberculous sputum sent to him to Kasauli for examination, in his report for 1902 diphtheria is not mentioned. It would certainly be worth while if all who have come across indubitable diphtheria in India would report the localities where it occurred, especially stating if the diagnosis has been confirmed bacteriologically. Until the prevalence of a disease is known adequate means to combat it cannot be devised, and if a man is told before he comes out that such and such a disease is unknown in India, he not unnaturally hesitates to diagnose it. To be forewarned is to be forearmed as regards both diagnosis and the provision of remedies.

REPORT ON A SMALL OUTBREAK OF CHOLERA IN 10TH D. C. O. LANCERS (HODSON'S HORSE) IN JUNE 1903.

BY E. A. C. MATTHEWS, M.B., B.C. (CANTAB),

CAPTAIN, I.M.S.

First case.—The first case occurred in a Sikh aged 32. When first admitted there was a history of having passed two loose motions followed by some collapse.

On admission he was collapsed, and haggard, but there was no vomiting nor purging; no cramps and no suppression of urine. He was isolated on suspicion, but it was only just before he died that he had any cramps, and passed two typical rice-water stools; death occurring five hours after admission.

Subsequent cases.—Ten other cases occurred between June 13th and June 20th, and were distributed all over the lines, three only recovering. The last case was interesting, in that he was the mess duffadar, and had not been to the lines for some days. He had a very severe attack, but was a sturdy man and made a good recovery.

Source of infection.—Samples of water from all the wells in the lines were at once forwarded to Kasauli for examination, with the result that vibrios were found in the water from the quarter guard well, but the others were free.

This well is on the main road, which is greatly used by coolies and others coming from the surrounding districts, in which cholera had been prevalent for some days; and there is every probability that the well was infected by a *lotah* or similar vessel used by one of these people.

Bearing of cases on this source of infection.—Infection from this well is the only way in which the wide distribution of the cases could be accounted for, as cases occurred in every squadron and amongst the followers, each having their own well for ordinary purposes, while the quarter guard well was resorted to by men on guard and after leaving the parade ground.

The mess duffadar had not been drinking from this well, but it transpired that he had

drunk water in the city the day before, where the disease was very prevalent.

Sanitary precautions.—The usual sanitary precautions were strictly carried out, and, in addition, all drinking water was ordered to be boiled; the last case in the lines occurred five days after this order, so that the incubation must have been as long as that, or more probably unboiled water had been drunk.

The day on which the last case occurred, the regiment was ordered into camp, but it probably had little or nothing to do with the outbreak ceasing, as the families of men had to remain in the lines, and no case occurred.

General remarks.—There was no prevalence of diarrhœa at the time, and very little fruit had been eaten in the lines, as it was an exceptionally bad year.

The cases were all remarkable for the severity of the collapse and the infrequency of purging and vomiting. In fact, nearly all the fatal cases would come under the type described by Manson as *cholera sicca*.

No case occurred amongst the sick attendants or families of the men attacked, but one occurred in a man who had helped another to hospital when the latter was attacked.

A Mirror of Hospital Practice.

BRIEF NOTES ON SURGICAL CASES IN THE MEDICAL COLLEGE HOSPITAL, CALCUTTA.

BY CAPTAIN E. O. THURSTON, I.M.S.,

Resident Surgeon, Medical College Hospital, Calcutta.

Tubercolous Disease of Breast.—K., female, *æt.* 36, Hindu. Four months before admission patient noticed a swelling in the right breast and also in the axilla; the swelling in the breast increased, and finally an abscess burst. On admission, the upper outer quadrant of the right breast was enlarged and indurated; in the centre of the indurated area was a small sinus discharging thin sero-pus; skin adherent. The axillary glands were enlarged, hard and not painful; there was also another enlarged gland in the left axilla and several scars in the neck, the remains of previous abscesses.

The breast was treated with hot lead lotion and the induration largely disappeared, but the sinus persisted. The area surrounding the sinus and the axillary glands were removed; the latter were typically tuberculous to the naked eye and the microscope confirmed the diagnosis. (Wards of Lieut.-Col. R. H. Charles, M.D., I.M.S.)

Sarcoma of Thyroid.—R., male, *æt.* 25, Mussalman. Three months before admission he noticed a tumour in the left side of his neck which rapidly increased, alteration of voice, difficulty of respiration and deglutition, with expectoration of blood, increasing in last two months.

On admission tumour about size of cocoanut on left side of neck in position of thyroid; hard and fixed to the deeper parts; skin not adherent. The trachea was pushed over to the right in a curve, the centre of the convexity being about one and-a-half inches from the middle line. Face suffused, voice a whisper, and he had attacks of increasing difficulty of breathing. *Operation*—Owing to the danger of giving chloroform the operation was started without any anæsthetic whatsoever; and the patient behaving as if he was insensible to pain, no anæsthetic was used; in fact, he made more complaint of some lotion entering his ear at the termination of the operation than he did during its progress. Incision along the anterior border of the sterno-mastoid, continued outwards along the clavicle, flap reflected and muscles over the tumour divided; the greater part of the tumour shelled out without very much difficulty, and with only a moderate amount of hæmorrhage, the respiration was much relieved. The tumour had pushed the great vessels of the neck over to the right, had caused a small perforation into the œsophagus and extended down into the mediastinum, so that after removal the apex of the pericardium could be felt. A sterilised sponge was placed in the large cavity left and a drainage tube. There was very little shock. Rectal feeding for three days and then nasal feeding added, on the fourth day milk escaped from the rent of the œsophagus; on the tenth day the feeding was carried out through a tube introduced into the rent of the œsophagus and retained there by the dressings; he did well, wound granulating and the cavity closing until the 26th day, when, after coughing, some hæmorrhage occurred at 12 P. M., this stopped with pressure but recommenced about 6-30 P. M. On opening the dressings there was a spurt of blood from the common carotid, about an inch above the clavicle; digital pressure easily stopped the hæmorrhage, but the softened arterial wall gave way until the rent extended about a quarter of the way round the artery. The artery, vein and nerve were absolutely matted together and attempts to separate the artery failed, it being impossible to get a small curved aneurism needle round the vessels a Macewen's hernia needle was passed round the whole mass and the vessel ligatured in the ordinary way with catgut; this stopped the hæmorrhage from the proximal end, but blood still came from the distal, so a further ligature was applied. Hæmorrhage again occurred, so a thick double silk ligature was tied with Ballance and Edmund's "stay knot," and this stopped the bleeding for the time; at 3-50 A.M., a further recurrence took place, and an additional catgut ligature was applied. He had fever in the next few days, developed pneumonia on the right side, and died on the 36th day. *Post-mortem.*—The

ligatures had included the vagus; (there was no obvious effect at the time of tying them), and there was pneumonic consolidation of the right lower lobe.—(Wards of Lieut.-Col. R. H. Charles, M.D., I.M.S.)

Alveolar Sarcoma of Femur.—M. U., male, *æt.* 20, Mussalman. Fall from horse about six weeks before admission; falling first on to his arms, and then the knees striking the ground; there was some pain in the knee from the time of the accident, but no swelling was noticed until fifteen days later, which swelling has gradually increased. He was quite able to walk during this period, but from the increasing size he began to get lame. On admission the right knee was semi-flexed and much swollen, the swelling being more prominent on the inner side of thigh and extending backwards, filling up the whole of the popliteal space; it was elastic but not fluctuating. No pulsation or egg-shell crackling. Slight œdema of the foot, and the pulsation of the posterior tibial artery was slightly diminished. Aspiration was performed, but only serous fluid and blood were withdrawn; no sarcoma elements were distinguished. The thigh was amputated at the junction of upper and middle thirds.

On dissection the popliteal surface of the femur was eroded, and springing from it were masses of soft yellowish white growth which had broken down, with the formation of cavities containing blood or serum. The popliteal artery and vein were normal. Microscopically the growth was a typical alveolar sarcoma.—(Wards of Lieut.-Col. R. H. Charles, M.D., I.M.S.)

Gangrenous strangulated inguinal hernia.—B.L., male, *æt.* 42, Hindu. Had a right reducible inguinal hernia for two years. Four days before admission it became strangulated with the usual symptoms. On admission patient not looking very ill, abdomen slightly distended, and coils of intestine visible through the belly wall; medium-sized hernia, tight and tender. No reddening or œdema of the skin. The sac contained a small quantity of sero-purulent, slightly offensive fluid and the cæcum and terminal portion of the ileum. The gut was purple and its walls much thickened; on the anterior surface of the cæcum was an oval area of gangrene occupying the position of the anterior longitudinal band, about an inch long and $\frac{1}{8}$th inch broad. The stricture was divided and the gut pulled down and the neck of the sac shut off with gauze; the gangrenous area was excised, the cut surface bleeding and the gap closed with interrupted silk sutures through all the layers, and with a line of Lembert sutures. From the thickening of the walls of the gut some difficulty was experienced in reduction, so the canal was partially slit up and a gauze drain put down to the sutured area. One suture was put in the canal. The after progress was satisfactory, gauze drainage discontinued on the third day; bowels opened on the seventh day by enema, and discharged on the sixteenth day.—(Wards of Lieut.-Col. R. D. Murray, M.D., I.M.S.)

CASE OF PULMONARY OSTEO-ARTHROPATHY.

BY T. H SYMONS,
CAPTAIN, I.M.S.,
General Hospital, Madras.

Anna Malé, *æt.* 22 years, weaver. Complains of tingling and pain in the joints. Illness of 3 years' duration. Place of birth and residence, Rani, North Arcot. Admitted, 21st February 1903. Examined, 7th March 1903.

Family history.—Parents living, keeping good health, no special disease in the family; none in his family ever had any complaint similar to what he has now. No history of tubercle in the family.

Previous health.—He had small-pox when seven months old; no illness of any kind after it,—no syphilis or gonorrhœa.

Social history.—Weaver by occupation, temperate in habits, always well provided for, unmarried.

History of present illness.—Three years ago the patient noticed some swelling of the knee-joints, the lower parts of the legs and ankle joints. The swelling, which was least marked in the morning, used to increase during the day, reaching its maximum in the evening, always diminishing somewhat during the night. This continued for about two months, at the end of which the parts reached about one and-a-half times the present size. Afterwards the swelling gradually and steadily went down and in six months the parts reached the present size, since which time they have remained stationary. One or two months he felt tingling and pain in the parts, which symptoms have persisted up to the time of admission. For the last one year he noticed a symmetrical swelling of the lower part of the forearm-bones and the hands, similar to those of the lower limbs, accompanied with the same tingling and pain.

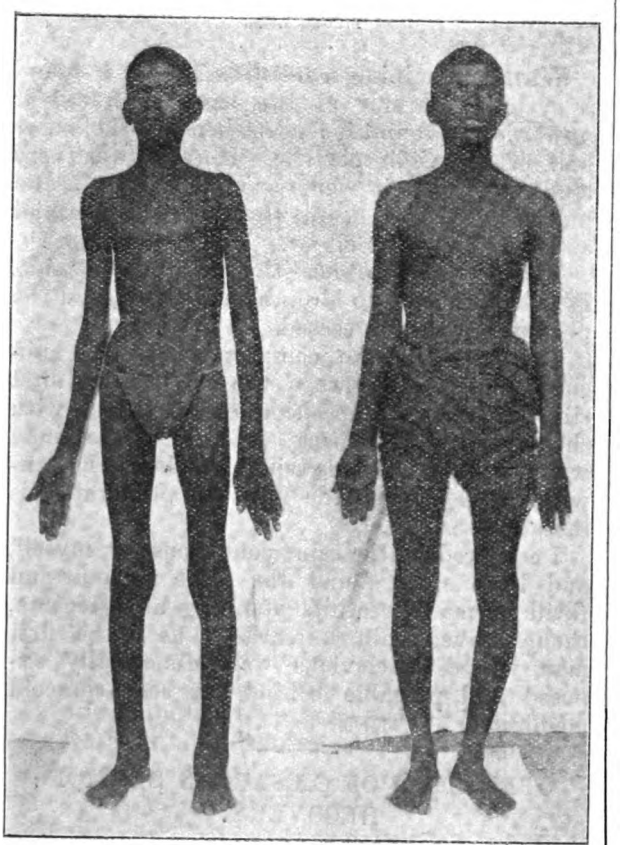
Since the commencement of the illness, free sweating has been a prominent symptom, occurring during sleep and during the day when the patient is at rest. He tires easily on the slightest exertion.

During the last two years he has been very subject to chills, always followed by marked diuresis. His appetite has always been good and bowels regular.

Present state.—The patient is thin, 5 feet 5 inches in height. When the patient stands and the arms are hanging by the side, the left arm appears to reach almost to the upper border of the left patella, while the right reaches a point 1 or $1\frac{1}{2}$ inches higher. There is a symmetrical enlargement of the legs and toes as well as the lower part of the forearm and hands and fingers, all of which enlargement is bony in character

In the lower limbs, the condyles of the femur, tibia, and fibula, except its head and upper part, are affected, patella not involved, greatest thickening round and above malleoli, toes all enlarged at the terminal phalanx. In the forearm the thickening involves the lower third or so of both bones, best marked just above the wrist, fingers enlarged at the terminal phalanx like the toes, tarsal and metatarsal bones not affected.

The skin over the leg bones appears a little thickened. In the knee and ankle joints, the depressions by the side of the patella and the malleoli respectively are obliterated by solid œdema.



MEASUREMENTS OF THE PATIENT.		MEASUREMENTS OF A NORMAL MAN FOR COMPARISON. (*Vide Photo.*)
Height 5′ 5″		Height 5′ 4½″
	R. L.	
From tip of olecranon to styloid process of ulna	11″ 11½″	10⅝″
From tip of olecranon to tip of little finger	17⅜″ 17″	15½″
From tip of olecranon to tip of middle finger	18½″ 18⅝″	17⅛″
Circumference of forearm 2″ below tip of olecranon	7⅜″ 7⅞″	9⅛″
Circumference of forearm at centre	6¼″ 6¼″	7⅝″
Circumference of forearm at lower end	6⅜″ 6⅜″	5¼″
Length of middle finger	4½″ 4½″	3½″
Circumference of first phalanx of middle finger	2½″ 2½″	2⅛″
Circumference last phalanx of middle finger	2″	1⅝″
Length of thumb	2¼″	2″
Circumference of first phalanx of thumb	2⅝″	2¼″
Circumference of last phalanx of thumb	2⅝″	2⅛″
Vertical measurement of thumb nail	1⅜″	⅝″
Transverse measurement of thumb nail	⅝″	⅝″
Circumference of lower end of femur	11½″	No comparison made of lower limbs.
Circumference of upper end of tibia	7⅝″	
Circumference of centre of thigh	12½″	
Circumference of centre of calf	10⅛″	
Circumference of 2″ above malleoli	8⅜″	
Circumference of 2″ at malleoli	11″	
Foot at instep	8½″	
Foot at ball of big toe	8¼″	
Foot from heel to tip of big toe	9½″	
Circumference of first phalanx of big toe	3⅜″	
Circumference of last phalanx of big toe	3⅜″	
Internal surface of tibia at centre	2″	
Internal surface of tibia at upper end	2¼″	
Internal surface of tibia at lower end	2¼″	
Transverse diameter of internal malleolus	1⅞″	
Transverse diameter of external malleolus	1⅞″	
Transverse diameter of fibula 2″ above malleoli	1⅜″	
	Rt. Lft.	
Antr. supr. iliac spine to tip of int. malleolus	35″ 35″	
Antr. supr. iliac spine to tip of int. condyle	19½″ 18⅞″	

Not taken for the left.

Practically the same for left.

Face.—Small, triangular, with the apex of the triangle at chin, asymmetrical, left side being more prominent, due to the prominence of the malar bone and the angle of the jaw. Nose deviates to the right and is very prominent, bridge of nose sunken and low, nasal bones normal. Palpebral fissure apparently normal, forehead small, vertical, not at all prominent. Tongue protruded in the middle line, uvula pushed over to the right, teeth fairly regular and good. Horizontal rami of lower jaw apparently not thickened, but the left angle of the lower jaw and the left ascending ramus are much thicker than the right. The alveolus of the superior maxillary from the first bicuspid back to the last malar on both sides fairly thickened. Hard palate, markedly arched and very high, no irregularity to be felt with the finger, left malar bone somewhat prominent, supra-orbital ridges not thickened and not prominent, zygomatic arch normal, occipital ridges are prominent.

Chest.—Narrow, small, phthenoid in character, clavicles, prominent, supra-and infra-clavicular

depressions well marked, no irregularity noticed in clavicle or sternum. Lower part of left chest when viewed from front appears to be more prominent than the right, epigastric angle normal, 70°.

Posterior view of chest.—Round shoulders, right inferior angle of scapula projects from the side, scapula not thickened. Angle of left scapula half an inch lower than the right. Lower part of the chest is very prominent, and the patient has a lateral curvature of the spine to the left involving the lower dorsal and upper lumbar regions. Spines of vertebræ not enlarged, evenly distributed and freely moveable, except in the lower dorsal region which, together with the upper two or three lumbar vertebræ, form a scoliosis to the left.

Left erector spinæ stands out in relief; no irregularities felt on ribs, left intercostal spaces much narrower than the right, tip of finger not able to be introduced.

The crest of the ilium, antr. supr. spine, &c., not involved.

Lungs.—Chest movements limited equally on both sides, percussion note normal, breath sounds normal.

Heart.—Apex beat in the fifth space half an inch inside nipple line, pulse 100 per minute, regular; heart sounds normal.

Abdomen.—Spleen and liver not enlarged.

Nervous system.—Sensation in touch, temperature, muscular sense, all normal; slight tenderness of muscles on firm pressure; muscular strength less than normal.

Reflexes.—Plantar reflex diminished; abdominal reflex normal; knee jerk exaggerated; ankle clonus absent; pupil reflex normal.

Eyes.—Field of vision and colour sense normal.

Ears.—Left not so acute as the right.

Urine clear, sp. gr. 10—16, acid in reaction, sugar and albumen absent.

COMMENTS.—The case is interesting because of its rarity. I cannot find any records of a similar case in the hospital reports of the General Hospital, Madras. As to diagnosis, I think there can be no doubt that it is a case of pulmonary osteo-arthropathy without any pulmonary symptoms or physical signs. The only diseases with which it might be confused are acromegaly and osteitis deformans. In the former the changes which take place are almost entirely in the bones of the face, hands and feet, all the long bones being free. Again, the whole of the hand is involved, giving it the appearance of being overgrown; optical symptoms are also common. As to osteitis deformans, it is essentially a disease of the fourth decade of life and is characterised by general thickening of the long bones, with bending of the same. Thickening of the frontal bone is also well marked, giving the characteristic appearances. From the description of the case above it will be seen it does not comply with that of either acromegaly or mollities ossium, but will tally with the usual description of cases of pulmonary osteo-arthropathy, *vide* text-books—Osler.

The case remained in hospital for about two and-a-half months, during which time he improved in general condition under tonic treatment, but no diminution was noticed in the osseous enlargements. My thanks are due to Lieutenant-Colonel J. Maitland, I.M.S., for the photograph.

A SIMPLE WAY TO COMPRESS THE SUBCLAVIAN ARTERY.

BY L. B. SCOTT, M.B. (CAMB.),

LIEUT., I.M.S.

WHILE examining a recruit's heart, I found a systolic murmur at the base. I traced it upwards and found it loudest beneath the outer half of the right clavicle. Here it was very loud, and with it were very marked thrill and pulsation. I also heard it along the brachial artery as far as the elbow. Was it aneurism?

I found the same condition on the left side. I told the man to drop his shoulders, and the phenomena at once ceased.

They were due to compression of the subclavian arteries between the clavicles and first ribs caused by the position of attention, with shoulders pressed back, in which the man was standing. By pressing his shoulder backwards and downwards I could obliterate his radial pulse.

I can produce the same conditions in myself, and have since found the same murmur and thrill in many recruits standing at attention, though never again so markedly as in the first man whose subclavians were abnormally exposed and palpable behind the costo-coracoid membrane.

OPERATION OF CÆSARIAN SECTION: RECOVERY.

BY J. STODART,

CAPTAIN, I.M.S.,

Akyab.

SONAZAN, a Bengali primipara at full term, age 30, was admitted on the evening of 23rd August 1903. She had been in labour since 3 A.M. I saw her at 7 P.M. and found her in an exhausted condition, the pains having practically ceased.

On examination I found prolapse of one arm. I tried in vain to return the prolapsed limb with a view to the operation of turning, but was quite unable to do so, both from the inelasticity and want of dilatation of the parts, and from the child being fixed nearly immovably in its position. After half an hour's hard work in attempting to turn I gave it up, and decided,

after a short deliberation, to perform a Cæsarian section in preference to any operation for breaking up the child.

Preparations were at once made, and the operation carried out in the usual way. The uterus was opened by a longitudinal incision along its interior aspect. The placenta was met with first and was torn through. A dead fœtus was then extracted.

The uterus was douched with 1 in 2,000 perchloride of mercury lotion and sutured. No blood-vessels were ligatured. On taking off the elastic ligature from the cervix some oozing took place, but this soon stopped on the application of pressure. I should have said that a hypodermic injection of adrenalin chloride, as well as one of ergotin, were given before the operation, and the former repeated during it. Extremely little blood was lost, and not a single ligature was applied to a blood-vessel throughout the operation. This effect, I imagine, was in some degree due to the above-mentioned doses. The woman progressed favorably from the day of operation, and beyond a little suppuration at the site of one of the sutures, there was nothing to retard recovery. She was discharged well on the 22nd September 1903.

CASE OF DEPRESSED FRACTURE OF THE SKULL: OPERATION, RECOVERY.

BY H. MARTYN NEWTON, L.R.C.S.E.,

CHURCH OF SCOTLAND,

Jalalpur Jattan, Punjab.

KARM DAI, three years of age, was admitted to hospital on March 18th, with the history of having five days previously fallen a distance of 15 feet. The patient was in a semi-comatose condition, and had been so since the accident. She was fretful on being handled. Examination showed a depressed fracture of the right parietal bone just above and a little to the back of the ear; from there a line of fracture could be made out running forwards almost to the root of the nose. At this latter point was a small soft pulsating swelling. The pupils were somewhat dilated and there was extensive extravasation of blood in the right orbit. Breathing was regular. Pulse quick. Right arm was kept still, though no sign of bruising. No paralysis of the left side. Bladder and rectum unaffected.

18*th*—*Operation.*—Two large flaps were made, with the purpose of avoiding the anterior or posterior temporal arteries. Thus very nearly the whole length of the fracture was exposed, a fracture five inches in length.

Over the parietal bone was a cone-shaped depression; of only a small part, however, was the continuity of the bone broken. Passing forwards was a gaping fracture, being at its widest, very nearly quarter of an inch. At this point the dura was torn to the extent of two inches, and brain substance was protruding. The depression was dealt with by means of a mastoid trephine. Three holes had to be bored, the last being at the apex of the cone, before the bone could be kept in position; since every time it was raised, it would spring back again.

The hernia was then dealt with. On pressing this gently back, a large quantity of blood escaped from the temporal region. The pressure thus being relieved, the brain substance slipped back into its normal position. Owing to the extensive laceration it was found impossible to stitch the dura.

The bones had to be left as they were, since with gentle pressure it was found that they would not meet. An undue force was not deemed advisable. The flaps were brought together, and firm pressure applied, and thus a reappearance of the hernia prevented.

19*th*.—No marked change in condition. Pupils dilated. Pulse 180. Breathing 29. Restless, and cries on being touched. The eyelids are closed. Moves the left arm, but not the right. Urine and motions normal.

21*st*.—Condition much better. Pulse 114. Respiration 24. Breathing easy and regular.

22*nd*.—Improving. Is beginning to take notice of her surroundings. Pupils are normal. Pulse 112. Respiration 20. No attempt at speaking.

24*th*.—Return of consciousness is more marked.

25*th*.—Much brighter to-day. Has laughed, but still no attempt at speech.

6*th April*.—Has been improving steadily during the last few days. The wound has healed. Over the frontal bones, the line of fracture can still be made out, but there is no swelling, nor any sign of pulsation. She now understands when spoken to, but cannot reply, although she can make a few sounds. She is able to use her right arm slightly. Points to her head and arm if asked where hurt. Was taken home to-day.

11*th*.—Was brought to hospital. Can now say a few words. She also tries to sit up. Understands everything quite readily. A small portion of the fracture can still be made out.

12*th May*.—Today she walked round the hospital with me. Speech quite restored; so too use of arm. Line of fracture perceptible.

Remarks.—Operation five days after accident. Consciousness began to return on the eleventh day after accident. Aphasia was the chief and most persistent symptom. Note that the escape of blood was from temporal region, and extravasation to the right eye. In this case the motor areas of arm and leg were only slightly affected. The paralysis of the right arm was no doubt due to injury of the arm itself.

One has come across fatal cases in which no operation has been attempted. This case is

sufficient to show that even after some days a favourable result may be looked for, and that with an operation presenting few difficulties.

POISONOUS SNAKES AND CALMETTE'S SERUM: A SUCCESSFUL CASE.

BY ASST.-SURGN. FEROZDIN MOHROOF,

Lyallpur.

A WOMAN named Hussan Bibi called at the Civil Hospital, Lyallpur, at 9 A.M., on 18th October 1903. She said she was bitten about an hour ago by a thick snake about two yards in length. It was of a yellow colour with black bands on its back. She mentioned that she was going to hold a wire post when the snake caught her round the left forearm and gave her a bite on the left hand. She felt the sensation of a needle pricking and that was all. No sooner had the animal inflicted its wound than it disappeared again.

On examination.—There were two fang wounds on the left thenar eminence half an inch distance from each other. These punctures were oozing blood. On the outer side of the first left metacarpal there were six teeth marks of a snake; these were oozing blood also; the place of bite slightly swollen and inflammed, more on the palmar aspect; the site of the wound was very painful, the pain was shooting and burning in the left wrist, left forearm and somewhat in the arm. Her eyes were congested. She was in pain and expressed desire to be left alone. Pulse was 96 a minute and breathing 42 a minute.

Treatment.—As soon as she came in, a light ligature was tied above the left elbow-joint, and an excision of the injected tissue proposed, which she and her friends refused. A full dose of 10 cc. of Calmette's serum was injected immediately below the ligature, which was removed by the patient after about half an hour. This injection was made at 9-15 A.M. on 18th October 1903. At 11 A.M. she expressed relief from the shooting pains; she said she only felt pain at the site of injection, and none in the limb at all.

At 5 P.M. next day, the woman complained of giddiness, confusion of ideas, dryness of throat, loss of power (slight in limbs) and heaviness of her body. Her pulse was 104 a minute temperature 99·4; she was breathing 35 times a minute. Another dose of 10 cc. was injected there and then in the corresponding portion of the limb. These symptoms subsisted gradually, and next morning she had only a temperature of 102, which was reduced by saline purge. The woman was quite well and entreated discharge on the 22nd October 1903.

The additional treatment was washing of the wound with Condy's lotion, and half a drachm of tinct. quininæ ammoniata every four hours. Hot soup and hot milk were given as food.

Conclusions.—A careful lens examination revealed the two fangs marks in front and six teeth marks at the back of the limb. The snake therefore was a fanged one and hence poisonous. From the colour and description I am of opinion that it was of variety Bungarus Fasciatus or Sankin. That Calmette's serum is really useful, is shown and proved from the above case.

I have had many opportunities of treating cases of snake-bite, but I think there is no hopeful case without the serum treatment.

SUPPOSED DHATURA POISONING: A PERSONAL EXPERIENCE.

BY KESHAVLAL MOTILAL MEHTA,

Hospital Assistant, Pachora.

THE following is a condensed narrative of Hospital Assistant K. M. Mehta's personal sufferings. On the evening of the 30th May, 1902, he dined with some friends. There were five people present, three adult males, a lad aged 13 years, and his hostess. The repast consisted of wheaten *chappaties, dal* and rice, vegetables, and a highly-spiced curry. Fifteen minutes after food he felt giddy and thirsty, so he drank some water and lay down. Then he felt burning hot, so he hurried off with his friend to his dispensary. He next experienced dryness of the throat and pain in swallowing, and his gait became unsteady. At this point one of the other adults began to be giddy and thirsty, and to experience the same train of symptoms. The Hospital Assistant took an emetic containing 30 grains of sulphate of zinc, which acted in three minutes. In spite of this, the symptoms progressed. The mouth was very dry, thirst unquenchable, swallowing painful, speech thick and difficult, some deafness; eyelids heavy, but no desire for sleep; hallucinations of vision, a stone appearing like a bunch of beautiful flowers, delusions of seeing familiar faces. There was great restlessness, which prevented him from lying, sitting or standing quietly, yet his gait was staggering when he attempted to walk. Next he experienced irritability of the bladder, causing him to pass a few drops of urine every few minutes. This condition of things continued up to 5 o'clock next morning, when he slept for 3 hours. After that his head felt heavy, he was slightly deaf, and vision remained indistinct for about 48 hours. All the others who partook of this meal went through the same experience, only their symptoms began later.

The cook, who cooked this meal, absconded with Rs. 750 worth of ornaments and currency notes. It was proved that on the day of the dinner the cook brought some dhatura capsules to the house, and said they were for a hair pomade. It is probable that the dhatura seeds were mixed with the capsicum seeds used in the curry. It appears that over a year after the event the cook has been arrested in Sholapur.

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ANTIVIVISECTION ANTICS.

AT the annual meeting of the National Antivivisection Society, the Honorary Secretary made a speech which he must have found cause to regret, since it led to his being put in the position of defendant in an action for libel and slander before the Lord Chief Justice, which ended in a verdict against him to the tune of £2,000 for damages and the payment of costs for a special jury. In his summing up the Judge stated that "a person who undertook to advocate a cause was not entitled to do so by charging other people with criminal offences unless he was able to substantiate such charges," and again, that "no man had any right to import into the public discussion of public questions slanderous defamations of any man unless he was prepared to prove those charges in a court of justice."

It is, we fear, a vain hope to expect that even this case will prove an efficient deterrent to the campaign of calumny against honourable men that is incessantly waged by amiable humanitarians with extreme views against vivisection, vaccination, venereal diseases, anti-rabic inoculation, alcohol, opium and even hospitals.

The Hon'ble Stephen Coleridge might have applied to the Home Secretary for the criminal prosecution of Professor Bayliss, who, as the law stands, was liable to a penalty of £50 for the first offence, and of £100 with the possibility of imprisonment for a repetition of the offence, —in the event of his being proved guilty. But he preferred to harangue a sympathetic audience in an impassioned strain, and to make a great public demonstration against the alleged iniquities of vivisection in general and of the physiologists at University College in particular.

Another obvious course was open to Mr. Coleridge. He might have directed the attention of the authorities at University College to the accusation preferred by the two ladies from Sweden, and he might have called on Dr. Bayliss for a refutation, or for such defence as he had to offer. But such a course does not commend itself to agitators, their *métier* is to agitate—themselves, or others by choice. But he elected to accept unconditionally the evidence of two foreign ladies of little experience in the subject, with a possible bias, inasmuch as they were Honorary Secretaries of the Swedish Antivivisection Society; ladies apparently impulsive in their actions since they published a book, or pamphlet, entitled *The Shambles of Science** against legal advice and even against the wish of Mr. Coleridge himself; ladies who insinuated that a vivisection experiment in which a dumb animal suffered torture was treated as a matter for fun and amusement. Even at the trial he produced the impression that he put more faith in them than in the evidence of honourable and distinguished scientific men of his own nationality who practise or advocate vivisection. Mr. Coleridge confessed to sending letters to some of the incumbents of London churches for distribution at the doors before services in order to prevent persons from subscribing to the Hospital Sunday Fund, because he suspected some of the money would be diverted to vivisection purposes. The alleviation of human misery and suffering must not be considered when the sacred cause of the animals is at stake! It is difficult to imagine a more extreme instance of a good man being blinded by partisan bigotry.

We have observed the same tendency amongst certain Calcutta papers that are only too ready to publish any accusation *against* Calcutta medical institutions and their medical staffs on mere *ex parte* statements, and even on the strength of anonymous letters, without first making a reference to the hospital authorities or any attempt to ascertain the truth. Give a dog a bad name and hang him, or any stick is good enough to beat him with, seem to be the principles they adopt in girding against a Government medical institution or its officials. These papers appear oblivious to the possibility of being duped by grievance-mongers or those who have axes of their own to grind. Legitimate criticism of a public institution is only right and proper in the interests of the public; but garbled,

* *The Indian Field*, notably a lover of animals, thus describes this production :—

The book, "The Shambles of Science," which figured in the trial came to me with a parcel of books for review, a month ago or more. More designedly mischievous drivel I never threw into the waste paper basket, and how any sane man could have supposed he could depend on the unsupported statements of the writers (those two Swedish ladies) is difficult to imagine. At least it was difficult to imagine till one read Mr. Coleridge's evidence.

exaggerated or false statements do not come under that category.

Let us now turn our attention to *The Abolitionist*, which is *the* journal of the British Union for the Abolition of Vivisection. At the trial it transpired that Mr. Coleridge had referred to the University College physiological laboratory as "this pit of Tophet;" but the copy of *The Abolitionist* now before us contains gems equally precious. The President of the American Anti-vivisection Society, a medical man by the way, calls vivisection "the abominable sin," "a relentless enemy," and he asks "is not licensing vivisection the same as licensing the social evil?" He thinks that abolition of vivisection would harm only the physiological chemists, "the Shylock dealers in useless serums, who think more of their ducats than their daughters." The idea of filthy lucre being the stimulus to which the vivisector responds is a common one, indeed *The Abolitionist* puts it very frankly thus:—

"The *Daily News* might have added that it is in playing on the millionaire's unbelief in any future life, and on his consequent anxiety to retain every hour of this life he possibly can that the vivisector may hope to find his Eldorado.

"It is becoming more and more the habit of millionaires to subsidize vivisection, as Lord Iveagh did to the tune of a quarter of a million, as others are invited to do for the benefit of cancer research, a doubtful benefit to the cancer patients present and to come, but a very certain benefit, we admit, to the pockets of the researchers, among whom even a trifle of £100,000 might divide very pleasantly." Leaving the grammar and composition out of account such insinuations are ridiculous. Physiologists are amongst the last people to be accused of making money their aim and object. Have we not the example of a late Professor of Physiology? Some years ago he was offered a munificent endowment to his chair of physiology conditionally on his stopping all vivisection work in his laboratory; but his reply was such a prompt and uncompromising negative that the would-be donor had to find other use for his money.

These accusations, however, are nothing to the charge of experimenting on helpless hospital patients. Yet such is the indictment of a medical man, a retired officer of the Indian Medical Service, and a Fellow of King's College. The following are extracts from a letter written by Deputy Surgeon-General J. H. Thornton, C.B., M.B., B.A., to the *Daily News* and printed in *The Abolitionist*:—

"Vivisection, like all cruel practices, is immoral and dangerous, tending to make its votaries callous, cruel, and unscrupulous." * * * "Vivisection has so greatly demoralised the medical profession in many foreign countries (especially in Germany) that many medical men have not scrupled to commit the abominable crime of experimenting upon the helpless hospital patients under their charge." He adds that in England it has led to reckless and unnecessary operating, and sometimes (rarely) to experimenting upon hospital patients.

Another retired officer of the Indian Medical Service, was called for the defence in the recent Coleridge trial, and gave evidence along with a Dr. Bowie to the effect that an experiment such as that performed by Dr. Bayliss to illustrate the fundamental law of secretion, and to compare the pressure of saliva with that of the blood, was unnecessary for the practical teaching of physiology to students.

A certain Dr. Hadwen, who writes M.D., L.R.C.P., M.R.C.S., etc., after his name, talks of "the hellish oorali," and boldly asserts that "the statistics of the Pasteur Institute are not worth the paper they are printed upon." * * * "It is the fashion to be inoculated for every innocent dog-bite in these days." Not content with this he condemns diphtheria antitoxin not only as worthless, but as "a very dangerous product," which has proved "a contributing factor to the death-rate." As to vivisection he calls it "an abominable sin," "an inhuman practice," "a relic of the barbaric past, which ought to be prohibited by law."

Mr. Stephens Smith, M.R.C.S., who has written a book on or against vivisection, remarks:—"That the most infamous cruelty occurs, the apologists of vivisection have tacitly admitted." * * * "I have published in detail the merciless experiments which I have seen perpetrated openly and without shame, in France, Belgium and Germany. But are horrors going on in England? They are. Ten per cent. of all cutting experiments in English laboratories are done under the drug curare. This paralyses the muscles while intensifying the sensibility to pain." * * * "From a considerable acquaintance with vivisection, I am convinced that vivisectors do not realise what they are doing, that the cries of the animal are to them only the creaking of a machine."

Professor Ruata, an Italian, is very severe on anti-rabic treatment. He asserts that the average mortality of rabies in Italy was about sixty-five per annum before the introduction of the Pasteur treatment; but this mortality has risen to 350 per annum with the founding of nine anti-rabic institutions, which treat about 3,000 individuals every year. He considers the muzzling of dogs to be the best way of diminishing the rabies mortality to zero. But in making such a statement he is sharply brought to book by *The Abolitionist*, in the following foot-note :—"We totally disagree with Professor Ruata in supposing that the troublesome (and often very cruel) muzzling orders of Mr. Walter Long have had anything to do with the disappearance of rabies in England, though the erection of Pasteur institutes has probably had a great share in multiplying cases of the disease by the excitement of the imagination on the subject." The uninitiated foreigner could scarcely be expected to know of the existence of the *National Canine Defence League*, which considers the muzzle to be *a distinctly unsanitary method*. It would scarcely be fair to quote the sentiments of a poet like Mr. William Watson, or an able essayist like Miss Frances Power Cobbe, so we have confined ourselves chiefly to the opinions of medical antivivisectionists, and we must confess that the writings of the latter appear considerably more virulent and less courteous in expression than the polished style of the former permits them to indulge in.

Well, the antivivisectionists have had a grand time, they have beaten their war-drums to some purpose in the *Daily News*, in their own special organ, and at their own meetings. They have also had a battle-royal in the law courts which has attracted considerable public attention, and they have been worsted in the fight as much by the evidence of their own witnesses as by the simple, straightforward testimony of their opponents.

LUSTIG'S SERUM.

The Treatment of Plague with Professor Lustig's Serum is a collection of papers written in a highly controversial strain on a subject that all must admit is very complex and abounding in pitfalls. Making due allowance for the manifold difficulties encompassing a thorough and practical trial of this serum, *e.g.*, the poverty and poor physique of the bulk of the patients treated, the delay usually occurring before such patients came under treatment, the practical and financial difficulties in the preparation of the serum, and many other points urged by Dr. Choksy, —nevertheless, one must unwillingly admit that the results have not borne out Dr. Polverini's forecast of an increase in the recovery rate by some 20 to 50 per cent. by this means. Still we cannot help admiring the untiring perseverance and sanguine courage in a good cause, under most discouraging circumstances, evinced by Drs. Polverini, Mayr and Choksy. The last of these appears as the chief protagonist in the clinical application of this serum, and he has done well to record his observations, extending as they do over four successive epidemics of plague and comprising over 1,500 cases, though he might, with advantage, have exhibited less warmth and wealth of argument *pro* his cause, and less coldness and contempt for facts that were *contra*, and for unbiassed individuals not gifted with his *perfervidum ingenium* who came to conclusions differing from his own. However great may be the future prospects of an improved Lustig's serum, yet we cannot ignore such results as those of 1900-1901, *viz.*, out of 104 cases treated with serum 81 died and 23 recovered, while out of 102 cases simultaneously treated without any serum 81 died and 21 recovered. The slight advantage of 1·53 per cent. in favour of this serum does not place it in the same category as anti-diphtheritic serum, which saves life without a shadow of a doubt, and we believe in far greater ratio than the mere 12 per cent. which Dr. Choksy credits it with. Moreover, compare the difference in dosage, and see how much remains to be desired in the reduction of bulk of Lustig's serum. In a series of 19 cases Dr. Choksy acknowledges the average dose to have been 400 cc., and that each of these cases received 1,000 cc. of this serum. Indeed he confesses to 1,580 cc. injected into a lad of 15 years in the course of 20 days, 2,405 cc. injected into a man of 30 years in the same number of days, and as much 400 cc in four injections of 100 cc. each at intervals of four hours. Yet 14 died out of the 19 cases. Then, again, it requires a robust faith to argue confidently over the depressing results at the Maratha Hospital during April and May, 1902. It is true only 93 cases were tested, and such a small number cannot in fairness be considered a final or conclusive proof. Yet what do we find? It was agreed that the cases should be dealt with in series thus:—1, 4, 7, 10 with Lustig's serum;

2, 5, 8, 11 with Roux-Yersin's serum; and 3, 6, 9, 12 with ordinary non-serum treatment. Of 31 cases allotted to Lustig's treatment all died; of 31 cases made over to the Roux-Yersin treatment 29 died; of 31 cases under ordinary treatment 29 also died. It is futile to argue that the Lustig cases "were placed at a comparatively greater disadvantage," that some cases were admitted dead, moribund or septicæmic, yet the cardinal fact remains that as many or more recovered without serum treatment as with it. Such a result must carry weight with responsible officials with a limited exchequer and pressed for funds. However regrettable and disappointing the discontinuance of the preparation of plague curative serum in the Municipal Laboratory at Parel may have appeared, yet it is difficult to see what other course could have been adopted after the Government subsidy had been withdrawn and the compulsory removal of plague patients to special hospitals had been abolished.

Professor Sir Thomas R. Fraser and the Indian Plague Commission are quoted in favour of Lustig's serum; but it should also be remembered that they made some adverse observations. They stated they were quite unable to detect anything in the nature of agglutination or morphological alteration in the plague bacteria brought in contact with diluted or undiluted serum either as prepared according to Yersin or Lustig. Moreover, by cultivation methods they were unable to detect the presence of any anti-bacterial substances in the serum. Their experiments on guinea-pigs with Lustig's serum and plague cultures were markedly unfavourable, indeed the control animals survived longer than those inoculated with Lustig's serum. Their remarks on the use of this serum on man specially with reference to the observations on which Dr. Choksy bases his conclusions are neither favourable nor flattering except in the third series, which they considered to afford evidence of a diminished mortality on the part of the patients who were treated with serum.

There can be few who doubt that our main or only hope of arriving at a plague specific, or prophylactic, lies in the lines of serotherapy. Let the advocates of Lustig's serum produce a more potent, more certain, and less bulky preparation, and let them show a substantial reduction in plague mortality with figures and tables that require no explanations, no selections, and no apologies; then it will win its way to public favour and scientific recognition without Government subsidy or support, although the latter will assuredly be forthcoming when the success of the serum is clearly demonstrated. The Government of India and the provincial governments have proved themselves both generous in expenditure on plague measures, and ready to adopt any expedients which give a reasonable prospect of success to rid this afflicted land of such a dire scourge.

A FORGOTTEN THEORY OF PLAGUE.

ALTHOUGH this theory of plague quite deserves its fate, yet it is possessed of some interest as illustrating the curious maze of devious paths along which medical observers permitted themselves to wander who followed the inductive method too closely, and who made—all unconsciously be it allowed—the facts to fit into their theories. It may also serve as a landmark and warning to ourselves in our present rather nebulous and transition stage, at which our successors fifty years hence will smile much in the same way as we may feel inclined to do in a kindly manner at the views which obtained half a centu ry ago.

Just fifty-five years ago Dr. Allan Webb, of the Bengal Medical Service, published the second edition of his *Pathologia Indica*, which was published by Thacker & Co. of Calcutta. Since it was obtainable in London from Allen & Co., and from Baillière & Co. in Paris, it was presumably a book of some importance, and its author was not unknown as Professor of Descriptive and Surgical Anatomy in the Calcutta Medical College, having previously been Professor of Military Surgery. As Curator of the College Museum it was his ambition to make it the great central collection for India of human, pathological, surgical and comparative anatomy; the Medical Board aided the scheme by inviting civil and military surgeons to forward specimens to Calcutta "through the regular channels," in addition to which the Medical and Physical Society presented their collection of over six hundred preparations. His book, the *Pathologia Indica*, contains full and faithful descriptions of specimens and cases, along with much curious information regarding the theory and practice of medicine in the East.

The influence of the air on the blood and its corpuscles, along with endosmotic action, formed the basis of his pathology, and sulphuretted

hydrogen was the pivot (if such a term is applicable to a gas) round which it revolved. Since Vogel showed the blood corpuscles to be disorganized in typhus fever, Dr. Webb *assumed* they must be so in plague even to a greater extent. These and analogous diseases he grouped as *organic diseases of the blood*, differentiating them from *functional diseases of the blood* " which present a state of blood, like that which follows excessive perspiration from exercise, or after excessive spirituous potation, wherein the blood corpuscles are found dark and wrinkled, such are functional changes in the blood. Cholera and sweating sickness I call functional diseases of the blood." In them the functions of the corpuscles are only perverted, and he thinks " we may reason inductively thus;—that which we see take place in animal membranes by applying sulphuretted hydrogen, may take place in the vesicular envelope of the blood corpuscles, and blood capillaries, thus endosmosis may be inverted. That which we see take place in one capillary tube, attached to a vessel full of water, and charged with only one kind of electricity, may take place throughout all the capillary pores of our bodies; and they may exude out their contents with preternatural rapidity. Cholera may, and probably does, arise in both ways."

According to this theory the first effect of sulphuretted hydrogen is to invert the endosmotic action of the corpuscles, hence cholera often glides into typhus, and typhus into cholera. The second effect of sulphuretted hydrogen is to burst and destroy the corpuscles, and so typhus fever is an intermediate condition that may merge into plague, while both are said to be closely related to the condition of the blood produced by the poison of the rattlesnake. Even the victims of the Black Hole of Calcutta are adduced as examples of this beautifully simple theory, the chaotic inconsistencies of which it were fruitless to discuss. The attention of the pathologist is invited to this tragic event, " for it affords proof invaluable, that *fever*, *gangrene*, and plague, may all result from the same *Polluted Air*." Again, it is laid down that cholera may approach in character typhus and plague on the one hand, and colic and sweating sickness on the other. He calls them "transition-forms of epidemic diseases, which yet are essentially the same disorder of the blood; the blood corpuscles having their vital endosmotic action reversed:—general filtration outwards, or the passive flow of vital fluids from the skin and bowels, is originated. They have all a common origin in bad air. The country whence these diseases have spread abroad, abounds in sulphuretted hydrogen of telluric origin, as in Sirhind, Rajpootanah, Marwar, and the whole of Sindh." It must not be supposed that Dr. Allan Webb was singular or eccentric in his views. Similar ideas obtained amongst most observers of the time. Notably a Dr. Searle, whose book was circulated to medical officers by the Court of Directors, held the same theories regarding sulphuretted hydrogen, though the conclusions he drew differed widely, as did his treatment.

In his description of Indian plague Dr. Webb stated that the Pali Plague originated in a geological tract in the North-West of India, which abounded in sulphur and sulphuretted hydrogen, and consequently in what he called *Sesmaria*, a term which is as little known now as malaria is well known. In addition to the Indian pestilence of 1838 he referred to the Kach and Kathiwar epidemics in 1817-20; and to that of Márwár in 1836-37. In the Pali Plague he recognised all the varieties of the Black Death except that which is now called the pneumonic type.

LONDON LETTER.

THE CASE OF MISS HICKMAN.

THIS case has excited a great deal of interest in this country. Miss Hickman was a lady doctor —M.D. of Brussels and L.R.C.P. & S. of Edinburgh. Her age was about 30, and she was a woman of strong physique, sound health, great intelligence and even, kindly disposition. She joined the Royal Free Hospital, in London on the 14th of August last, as *locum tenens* for one of the resident staff who had gone on holiday. About midday on the 15th of August she left the hospital, and, except that she had been seen on that day by a student of the hospital and a postman, nothing more was heard of her till the 18th of October, when her body was found in a plantation of Richmond Park. The fact of her disappearance was promptly made known, descriptions of her person and dress were widely distributed, and a substantial reward offered for any clue to her whereabouts—alive or dead. The most careful search was made everywhere by the police and public during these two months without the faintest result, and eventually

the discovery of her remains was made accidentally by some boys searching on a Sunday afternoon for chestnuts. That a middle-aged woman in the full possession of her senses and while performing the duties of a responsible professional engagement, should all of a sudden disappear and leave no indication of the manner or cause of her strange and inexplicable fate, created quite a sensation. The wildest rumours and suggestions were started. It was thought that this was a case of sudden loss of memory or mental oblivion, and many instances of this condition were cited in the papers. It was mooted that she was kidnapped and retained in concealment, or murdered and her body disposed of. It was hinted that her relations with the hospital officials had been strained, and that the responsibilities of the post she held had unduly strained her mind and feelings. But no satisfactory evidence could be obtained in support of any of these views. When at last her body was found it was decomposed, and to some extent dismembered and mutilated by animals. It lay in a close thicket in a sleeping attitude, and no sign of struggle existed, nor did the examination of the body reveal any evidence of violence. A portion of the stomach was secured, and chemical analysis gave distinct proofs of the presence of morphia. She had bought morphia tabloids on the day of her disappearance, and these with a hypodermic syringe were found. The evidence produced at the inquest, which was prolonged and searching, gave rise to a verdict of suicide by morphia while in a state of unsound mind. It came out that several members of her family had suffered from neuroses of various kinds, and it seems almost certain that her work and responsibilities at the Royal Free Hospital had upset her mental balance and caused her to seek refuge in lethe.

Cases of sudden disappearance must be familiar to most civil surgeons in India, but they are of a very different sort. The history of them is generally a quarrel, the disappearance of one of the parties to the quarrel, and an imputation of murder against the other party. Information is given to the police and search made for the *corpus delicti*. Rivers and khals are dragged and bones are found, which are submitted wrapped up in rags and contained in an old *chattee* for examination by the police. These generally turn out to be the bones of sheep or goats. In time the homing instinct which is so strong in the native of India proves too much for the fugitive, and he turns up sooner or later in his native village, hoping perhaps that meantime his enemy has been hanged. I remember giving evidence in one such case before the Calcutta High Court. A collection of bones was placed before me which I had no difficulty in identifying as the leg bones of a sheep. The collection contained a human pelvis, but it was the pelvis of a young female, whereas the murdered party was alleged to be a full grown man. The case promptly broke down, and the accused was acquitted.

BAYLISS *versus* COLERIDGE.

A noteworthy trial has this day been concluded in the Court of King's Bench before the Lord Chief Justice and a special jury. The facts are very simple. The Hon'ble Stephen Coleridge, Honorary Secretary of the Anti-vivisection Society made on the 2nd of May last in St. James's Hall a highly inflammatory speech at the annual meeting of the Society in which he read a description given him by two Swedish ladies—rabid anti-vivisectionists—of an experiment on a dog performed in the preceding February to illustrate a lecture delivered by Dr. W. M. Bayliss, Assistant Professor of Physiology. These ladies alleged that contrary to the provisions of the law the animal was not deprived of consciousness and exhibited signs of acute suffering. Mr. Coleridge accepted this testimony without further inquiry, and made it the basis of a heated tirade, ending with a suggestion that the public should take the law into their own hands and proceed to demolish the laboratory. An inquiry was made by the Home Office which resulted in an emphatic contradiction of the allegation, and a statement that Professor Bayliss had not transgressed the law. Mr. Coleridge refused to accept the authoritative contradiction of these ladies' report, or to believe Dr. Bayliss' denial. Hence the trial. The accusation amounted to a charge of committing a serious crime and so acting that the professor was unfit for his appointment, and an immoral, mendacious man. There was no difficulty in proving that all the requirements of the law had been observed scrupulously, and the testimony of Mr. Coleridge and his supporters indicated reckless prejudice and blind prepossession. They succeeded in fatally damaging their case and seriously discrediting their cause. The result was that the jury promptly returned a verdict for the plaintiff (Dr. Bayliss), with £2,000 damages.

and costs. Probably this will make Mr. Coleridge more rabid than ever; but it ought to teach him a lesson of sense and caution in attacking honourable persons engaged in scientific pursuits for humane and worthy objects. Every one—medical or lay—must sympathise with a movement to minimise the sufferings of animals; but the method by which this Society and its agents and officers conduct the crusade against cruelty are unscrupulous and objectionable. It is a pity that they do not direct their efforts towards reducing or abolishing cruelty and suffering in sport. Nothing can be less justifiable, for example, than doing a wretched fox to death in order to gratify murderous instincts, which are a survival of savagery in humanity, and have no other purpose than affording "amusement" to idle men and women. Killing birds for the sake of trimming hats falls under a similar condemnation, and even when the victims of "sport" are afterwards consumed as food, the killing is associated with the cruel wounding and lingering painful death of many. Some of the opponents of vivisection indulge in pursuits which are inconsistent with their principles, and it would be more logical and rational if they included in their diatribes all forms of cruelty and needless suffering. It is also apparent that if vivisection contributes to the cure of disease and saving of life, their advocacy of its abolition is a manifestation of cruelty and wrong towards the human race.

THE MICROBE OF YELLOW FEVER.

The discovery of the agency of the mosquito in the conveyance from man to man of the infection of yellow fever has stimulated the search for the micro-organism which there is every reason to believe is the exciting and efficient cause of the disease. This search until recently has been infructuous, and it has been alleged that the microbe is "ultra-microscopic," that is so minute as to be beyond detection by the most powerful instruments of the present day. Sir Patrick Manson with his wonted sagacity surmised in the latest edition of his work on *Tropical Diseases*, that the discovery would be made by careful examination of infected mosquitoes. The prediction appears to have come true. Early in 1902 a medical commission was sent by the Surgeon-General of the United States Army to study the disease in Mexico, Central and South America, more especially from the point of view of etiology. It consisted of Drs. Beyer, Pothier and Parker, and from a report submitted by these gentlemen in February, 1903, the following important conclusions have been drawn:—

"(1.) Bacteriological examination of the blood of persons with yellow fever during life, as well as of the blood and organs immediately after death, in uncomplicated cases is negative. (2.) The mosquito known as *Stegomyia fasciata*, when allowed to suck the blood of a yellow fever patient after the lapse of 41½ hours from the onset of the disease, and subsequently fed on sugar and water for 22 days and one hour and a half, can, if permitted to bite a non-immune person, produce a severe attack of the disease (3.) *Stegomyia fasciata* contaminated by sucking the blood of a yellow fever patient and then killed, cut into sections and appropriately stained, presents with regularity a protozöon parasite *Myxococcidium Stegomyiæ* that can be traced through a cycle of developments from gamete to the sporozöite. (4.) *Stegomyia fasciata*, fed on the blood of a person with malarial fever on normal blood or artificially, does not harbour the *myxococcidium*.

These observers found no evidence that any other description of mosquito was capable of acting as a host of the organism in question. These statements must be taken *quantum valeant;* but they certainly seem to advance the question materially.

K. McL.

19*th November* 1903.

Current Topics.

THE HARVEY MEMORIAL.

THE portraits of the late Major-General R. Harvey, C.B., D.S.O., I.M.S., painted by Mr. S. Melton Fisher, London, have arrived in Calcutta, and are on view at Messrs. Thacker, Spink & Co., 5 and 6, Government Place, Calcutta. One is a three-quarters length portrait in uniform for the United Service Club at Simla, and the other is a half-length in civilian clothes for the Eden Hospital, Calcutta. The sum of £200 has been paid as honorarium to the artist; but he has been obliged to defray the cost of framing and freight to India. A further sum of £25 is required to cover all incidental expenses and to reimburse the artist for charges that should certainly not come out of his pocket. Towards this amount only two subscriptions have been received in response to our appeal made in the

Indian Medical Gazette for October, 1903, *viz.*:—

Lieut.-Col. R. Neil Campbell, I.M.S., Dacca ... Rs. 32
Col. M. D. Moriarty, I.M.S., Nagpur ... ,, 50

Subscriptions are solicited from I. M. S. officers for the remainder of the debt, which amounts only to about Rs. 300.

EXTENSION OF THE SALE OF QUININE IN BENGAL.

OWING to a reduction of cost in the production of sulphate of quinine the Government of Bengal, at the instance of the Government of India, have extended the sale of small packets as follows:—Pice packets are to contain 7 grains instead of 5 grains, and 2-anna parcels each containing 8 packets are obtainable along with a copy of printed instructions for self-treatment. A short vernacular notice is printed on the paper containing the pice packet, advising persons suffering from fever to take 3 packets or 21 grains in a day. Printed instructions in the vernacular are also to be put up in all post offices and to be widely distributed.

COLLECTIVE INVESTIGATION OF DIPHTHERIA IN INDIA.

CAPTAIN J. W. CORNWALL, I.M.S., has suggested the subjoined form for a collective enquiry into the prevalence of diphtheria in India. There is no doubt of the occurrence of this disease in the large cities of India, and cases are not unknown in the mofussil.

COLLECTIVE ENQUIRY INTO THE PREVALENCE OF DIPHTHERIA IN INDIA.

Name of observer.....

Number of cases seen (as far as possible separately tabulated).	Age.	Race.	Locality.	Result (death or recovery).
1	...	...	...	... ...
2				
3				
4				
5				
6				
7				
8	...	...	...	... ...
9				
10				
11				
12				
13				
14				
15				
16				
17	...	...	...	... ...

Number of above cases that were confirmed bacteriologically.
Number treated with antitoxin and results.
Length of time the antitoxin has been in the country in each instance.

A SPECIAL NUMBER ON INTESTINAL PARASITES.

THERE can be no doubt of the scope for a special number on this subject, considering how largely entozoa bulk in the dispensary returns of India. From several communications received it would also appear that there is a desire for such an issue. It is proposed, therefore, to produce a special number on Intestinal Parasites, and the diseases or symptoms which they give rise to, in April, 1904, if sufficient material is forthcoming. Communications should be sent in before the 1st March, 1904, if possible.

AN ACCOUNT OF ANTI-MALARIAL WORK CARRIED OUT WITH SUCCESS IN SELANGOR, ONE OF THE FEDERATED STATES OF THE MALAY PENINSULA.

BY E. A. O. TRAVERS,

State Surgeon, Selangor.

THE following brief history of a severe outbreak of malignant malarial fever in a malarial district, with a short account of the measures taken to deal with it, will, it is hoped, be of some value as an instance in which systematic efforts, made with a view to the destruction of the breeding grounds of the mosquito, have been attended with immediate and marked success.

The district of Klang, in the State of Selangor, one of the Federated Malay States, has for several years been recognised as distinctly malarial.

The following figures, giving the number of cases treated at the Government hospital, will show the steady increase of malarial fever among the inhabitants of the district.

CASES OF MALARIA TREATED AT THE DISTRICT HOSPITAL, KLANG.

Year.	In-patients.	Out-patients.	Total.
1899	251	668	919
1900	467	737	1,204
1901	807	965	1,772

GENERAL CHARACTERISTICS OF KLANG TOWN AND PORT SWETTENHAM.

The town of Klang is situated on swampy ground, lying between the Klang river, from which it takes its name, and a semi circle of low hills.

Until September, 1901, Klang was the terminus of the Government railway and the port of the State.

Navigation of the river being attended with many serious difficulties, and the accommodation at the port being insufficient for the rapidly increasing needs of the State, it was resolved to make a new port near the mouth of the river.

The anchorage selected was a good one, but about half a mile of mangrove swamp intervened between the shore and a wide extent of flat, peaty land, partly cultivated by Chinese agriculturists.

The mangrove swamp was intersected by a narrow road running up from the coast to Klang, some five miles away.

In the year 1897, a strip of mangrove jungle was felled and work was commenced by the contractor for the wharves, and the Government employees engaged in the construction of the railway, which was continued from Klang to the new anchorage.

While these works were being carried out, the coolies who were quartered in temporary huts raised above the swamp on wooden piles, suffered occasionally from fever, but no very marked outbreak occurred.

The railway bank running parallel with the shore, as well as the approaches to the wharves and houses, were constructed of earth brought from some miles up the line. In this way a considerable extent of land was partly shut off from the sea and in process of time large

shallow pools were formed by rain water* which remained stagnant, the sea water no longer spreading over the land with each rising tide.

As the work on the new port approached completion the cases of fever occurring among the labour force increased both in number and severity.

On September 15th, 1901, the port was opened, and was named Port Swettenham. Almost immediately afterwards it was noticed that the cases of malaria had increased in number to an alarming extent. Almost the whole of the labour force was attacked, many severe cases also occurring among the crews of the ships lying alongside the wharves

Of 133 persons living in Government quarters, 80 suffered from malaria between September 15th and November 26th.

Of 27 temporary shop houses with 127 inmates, no less than 78 persons, living in 25 of the shops, contracted the disease during the same period.

Some 80 coolies were admitted to hospital with fever and of these eight died.

The types of fever as diagnosed by means of the microscope were as follows :—

Malignant (æstivo-autumnal)	72·5%
Benign Tertian	25·5%
Mixed Benign Tertian and Malignant...	2%

No cases of Quartan fever were observed.

An examination of blocked drains and shallow pools along the whole of the sea front, and by the side of the road, revealed large numbers of both Anopheles and Culex larvæ.

The very serious nature of the outbreak having been fully represented to Government by the Medical Department, a Commission, consisting of three medical men and three civil engineers, was appointed to advise Government as to the best means of improving the sanitary condition of Port Swettenham.

The first meeting of the Commission was held on November 18th, 1901, and the following recommendations were subsequently made :—

1. That an extent of about 150 acres of the mangrove jungle be felled and cleared.
2. That levels be carefully taken over the whole of the surroundings of the port
3. That the space which it was proposed to lay out as a township be divided into four sections, each of these sections being protected by bunds or banks raised to a height of fifteen inches above high flood level. That each section be provided with one or more main drains and necessary subsidiary drains. The outlet ends of the main drains to consist of iron pipes fitted with flap-valves, which, while permitting water to flow out of the drains into the sea at low tide, would be automatically closed by the rising tide, so as to prevent water passing up the drains on to the protected area.
4. That all low-lying ground and disused drains be filled up and levelled with earth brought by rail from up-country.

The recommendations of the Commission were at once acted upon by Government, and the various works were put in hand without delay. In the meantime, all pools known to contain mosquito larvæ were regularly sprinkled with crude kerosene oil, applied by coolies with watering cans.

The majority of the coolies working at the port were given a daily dose of 10 grains of quinine as a prophylactic.

By December 10th, Dr. Watson, Surgeon in charge of the district and a member of the Commission, was able to report a marked improvement in the health of the coolies.

SANITARY WORKS CARRIED OUT AT KLANG TOWN.

The prevalence of malarial fever and the urgent need for sanitary improvements in the town of Klang were represented to Government early in the year 1901, by means of a most able and convincing report by Dr. Watson, who showed that Anopheles larvæ were to be found in almost every pool and drain in the town, while at the same time the number of cases of malarial fever occurring among the inhabitants had increased to an alarming extent.

Sanction having been obtained for the necessary expenditure, a large main drain, with a tidal flap, was constructed, and a carefully-planed system of subsidiary drains connected with it, all pools and low-lying swamps being at the same time filled in with earth brought from the neighbouring hills.

RESULTS OF SANITARY WORK.

The result of the measures taken to improve the health of Klang and Port Swettenham has been most striking, as may be seen from the following figures :—

CASES OF MALARIA TREATED AT THE DISTRICT HOSPITAL, KLANG.

Date.	In-patients.	Out-patients.	Total.
1900 ...	467 ...	737 ...	1,204
1901 ...	807 ...	965 ...	1,772
1902 ...	364 ...	403 ...	767

The above figures show a marked reduction in the number of cases admitted to hospital from the whole of the Klang district.

The following statement relating to the town of Klang and Port Swettenham only is, however, still more remarkable.

NUMBER OF CASES OF MALARIAL FEVER ADMITTED TO HOSPITAL FROM KLANG TOWN AND PORT SWETTENHAM DURING THE MONTHS OF OCTOBER, NOVEMBER AND DECEMBER 1901 AND 1902.

Month.	Klang.		Port Swettenham.	
	1901.	1902.	1901.	1902.
October ...	24	8	34	3
November ...	56	2	79	3
December ...	36	1	23	9
Total ..	116	11	136	15

During the year 1901, 52 deaths occurred among malarial cases admitted to the District Hospital from Port Swettenham and Klang town.

During the year 1902, only nine deaths occurred among cases of malaria admitted from these stations.

The following return is of special interest as showing that, while in the town of Klang and Port Swettenham, malaria has decreased to a remarkable extent, in other parts of the district there has been a slight increase in the number of cases.

CASES OF MALARIA ADMITTED TO THE DISTRICT HOSPITAL.

	1901.	1902.
From Klang Town and Port Swettenham...	610	197
From rest of Klang district ...	199	202

It will be seen, therefore, that in the town and port, where extensive sanitary works were carried out, malarial fever has decreased by 67·37 per cent., whereas in the remainder of the Klang district, which has not been dealt with in any way, the cases of malaria have actually increased by 3·55 per cent.

This, I think, conclusively proves that the very marked improvement in the health of the inhabitants of Klang Town and Port Swettenham is directly due to the works undertaken by Government and not to a general decrease in the prevalence of malaria in the district.

For the above figures I am indebted to Dr. Watson, whose annual report on the Klang district for 1902 deals fully with the subject.

* The annual rainfall in the Klang district averages about 100 inches.

COST OF ANTI-MALARIAL CAMPAIGN.

Klang Town.—The total estimated cost of the drainage and earthworks was $20,000, or about £1,800.

Port Swettenham.—The cost of the various works has been approximately as follows :—

Filling swamps	$15,730
Drainage	4,800
Bunding, including tidal gates	6,400
Felling jungle	1,620
Miscellaneous	1,450
Total ...	$30,000

Or about, £2,700.

It may be noted that there has been no special expenditure on expert advice, all necessary supervision having been carried out by the regular Government staff. Thus all the money voted for the purpose has been expended on the work itself, the whole of which is of a permanent nature.

I cannot conclude this brief report without alluding to the prompt and businesslike way in which this emergency was dealt with by the Government of the Federated Malay States. The proposals made by the engineering and medical staff were acted on without question, and the expenditure of a comparatively large sum of money was sanctioned without delay. The confidence shown by Government in its professional advisers has, I consider, been fully justified

KUALA LUMPUR, 15*th August*, 1903. } E. A. O. TRAVERS.

COLUBRINE & VIPERINE SNAKE VENOMS.

BY CAPT. LEONARD ROGERS, M.D., M.R.C.P., F.R.C.S., I.M.S.

"On the Physiological Action and Antidotes of Colubrine and Viperine Snake Venoms." By LEONARD ROGERS, M.D., B.S., M.R.C.P., F.R.C.S, Indian Medical Service. Communicated by Dr. A. D. WALLER, F.R.S. Received and read November 19, 1903.

(From the Physiological Laboratory of the London University.)*

(Abstract.)

Paper read before the Royal Society, London.

Part I.—COLUBRINE VENOMS.

The Indian Colubrine snakes other than the Cobra have been little investigated since the classical work of Fayrer, Lauder Brunton and Wall. Their physiological actions are dealt with in this paper.

I. The Naia Bungarus or Hamadriad is the largest poisonous snake. The symptoms produced by it are identical with those of Cobra venom, and its toxicity is very similar in degree to it.

Its hæmolytic action is very slight compared to that of the Cobra, its power in this respect being only about one-hundredth that of the latter.

Blood-pressure and respiratory curves of this and the other venoms dealt with in this paper have been taken in the case of cats and rabbits by means of a Gad's manometer connected with a canula in the carotid artery, and a Sandström recorder connected with a tracheal canula, with the following results :—

In Experiment I a dose of 5 milligrammes per kilogramme produced paralysis of respiration in 1½ minutes followed by circulatory failure of a secondary nature in 2 minutes. In Experiment II 1 milligramme per kilogramme produced a temporary stimulation of respiration followed by complete failure in 10 minutes. In Experiment III a very similar result was obtained, while, in addition, it was found that by means of artificial respiration the circulation could be kept going long after total cessation of breathing. In each case the motor end-plates of the diaphragm were paralysed at the end of the experiment, but by means of stimulating the nerve at intervals during the experiment it was found that this paralysis did not take place until after that of the respiratory centre.

The action of Hamadriad venom then, in all respects, resembles that of the Cobra, with the exception that it has very little hæmolytic action.

II. The *Bunjarus fasciatus* or Banded Krait, although a large snake, has always been considered the least deadly of its class in India. The symptoms which it produces are very similar to those of the rest of the class, only in addition it may cause a chronic affection. This difference I find is due to its containing some of the viperine element in addition to the Colubrine one, and it may thus produce intravascular clotting in large doses. The blood-pressure and respiratory tracings show the typical respiratory paralysis of Colubrine venoms, but in addition it causes a marked primary fall of blood-pressure, while artificial respiration fails to keep the circulation going, as with the other Colubrine venoms. Heating to 90° C. for a short time greatly lessens this effect on blood-pressure and renders artificial respiration much more efficacious, owing to the viperine element being more readily destroyed by heat than is the Colubrine one. The venom also produces motor end-plate paralysis like the other Colubrines.

III. The *Bunjarus cæruleus* or Krait is a small but deadly snake. The symptoms produced by it are identical with those of Cobra venom, and a blood pressure and respiratory tracing shows that it paralyses the central respiratory centre in the same way as the latter. Its action on the phrenic end-plates is, however, somewhat less marked than that of the other Colubrines.

We see, then, that each of these venoms causes death by paralysing the respiratory centre just like Cobra and sea-snake venoms, but in addition the venom of the Banded Krait has a viperine element which produces a primary fall of blood pressure, and sometimes intra-vascular clotting, thus resembling the Australian Colubrine snake, the *Pseudechis porphyacus*.

Calmette's antivenin has an undoubted specific action against Cobra venom. It, therefore, becomes a matter of practical importance to ascertain if it is also effective against the other Colubrine and sea snakes, whose lethal action is identical with that of the Cobra. A series of experiments have been carried out by mixing about ten times a fatal dose of venom with different quantities of the serum for half an hour before injection and noting the results. It was first tested against the common variety of of the Cobra, which it neutralised more readily than it did the venom of a less common kind. It acted next best against the Hamadriad or King Cobra, and only a little less so in proportion to its toxicity, against the *Enhydrina Bengalensis*, a sea-snake.

* A grant-in-aid of this research was received from the Royal Society.

In the case of the Krait its action was much more feeble, although still distinct, while in that of the Banded Krait it prevented all Colubrine symptoms, if a sufficient dose was used, but the animals died 2—4 days after with symptoms of chronic viperine poisoning, thus confirming my conclusion that this venom is a mixture of the two elements.

These results are of great interest in showing that the serum has a definite action in neutralising the respiratory paralysing poison of all the Colubrines and the Hydrophidæ, although it will require to be made stronger than it is at present, if it is to be relied on to cure the bites of those snakes against whose venoms it has the lesser degrees of action, and those which eject a very large quantity of venom. I would suggest that a more generally useful antivenin might possibly be prepared by using a mixture of different Colubrine venoms in the preparation of the serum.

Part II.—The Vipers and Pit Vipers.

A. *The Viperidæ*—I. The *Daboia Russellii* produces intra-vascular clotting in small animals, and loss of coagulability of the blood in man, accompanied by hæmorrhages from the bowel, etc. This latter chronic form of poisoning can also be induced in smaller animals by first giving small subcutaneous or intra-venous doses to produce the negative phase of reduced coagulability of the blood, and then larger, lethal amounts. As I found that in this way quite rapid deaths without any intra-vascular clotting could be caused by intravenous injections of the venom, accompanied by remarkable primary failure of the circulation, I have made a prolonged investigation of this phenomenon, using the venoms of two vipers and two pit vipers, with results of considerable interest. The direct application of stronger solutions of the venoms than those used in the experiments when applied directly to frogs' hearts, did not stop their action, while in many of the blood-pressure tracings it was evident that the heart continued to beat regularly during and long after the pressure fall. When the pressure fall was sufficiently rapid to stop the respirations by cutting off the blood supply of the medulla, on the occurrence of respiratory convulsions of asphyxial origin the blood pressure was frequently pumped up again in a remarkable manner and the respiration recommenced. Further, the increased excursions of the pulse during the fall of pressure, and the common occurrence of marked Traube-Hering curves pointed to a relaxation of the blood vessels of vaso-motor origin.

In order to ascertain if the fall in pressure was due to a central vaso-motor paralysis, further experiments were carried out with Daboia venom. In Experiment VIII the spinal cord of a dog was cut in the cervical region, and artificial respiration kept up. A subcutaneous followed by an intravenous dose of the virus was injected, and no sudden fall of pressure occurred, and the heart continued beating for some minutes, proving that the falls previously obtained were not due to direct action of the venom on the heart. In Experiment IX the circulation in the omentum was observed to undergo a very marked vaso-motor dilatation coincidently with the usual fall in blood-pressure, while, after this was complete, no further persistent fall occurred when the cervical cord was cut, proving that complete paralysis of the central vaso-motor centre had already taken place. Lastly, a record of the portal blood volume changes, due to the amount of blood entering the vessels of a large loop of small intestine placed in an oncometer, were recorded simultaneously with the general blood-pressure in the carotid artery, and marked vaso-motor dilatation was observed to take place coincidently with the fall in the general blood pressure, instead of a passive diminution in its volume, which should have taken place if the circulatory failure had been due to a direct action on the heart itself.

That the vasomotor affection was central, and not peripheral, was shown by the fact that both a small dose of Daboia venom (and also a large one of Cobra) produced contraction of the vessels of the limbs through which blood was transfused after separation from the influence of the central nervous system, while adrenalin extract and nicotine caused marked elevation of the blood-pressure of a temporary nature after complete paralysis of the central vaso-motor centre, as shown by a stimulation of the central end of the sciatic nerve failing to produce any rise of the general blood-pressure.

II. *The African Puff Adder.* This venom (for which I am indebted to Dr. J. W. W. Stephens) produces intra-vascular clotting like Daboia venom in small animals, but it is much easier to produce the negative phase of lost coagulability, and thus produce death without any clotting with it than with Daboia venom itself The blood-pressure and respiratory curves in such cases resemble in every important essential those of Daboia venom without clotting. Adrenalin extract has the same effect in raising the fallen pressure, as does nicotine, which was suggested to me by Sir Lauder Brunton. Further, a very marked vaso-dilatation of the portal circulation in a loop of the small intestine, coincidently with the fall in the general blood-pressure, was recorded. The puff adder venom also had a very marked effect in producing petechial hæmorrhages in the peri- and endo-cardium, and in the mesentery and omentum in particular, which is not at all an important feature of Daboia poisoning.

B. *Crotalidæ.* I. *Crotalus horridus*, or Rattlesnake. I am indebted to Dr. J. Brunton Blaikie for this venom, the hæmorrhagic symptoms produced by which are well known. Blood-pressure and respiratory tracings of the action of this venom showed that the same primary failure of the circulation, as in the former instances, is produced by it, but without any intra-vascular clotting, except rarely at the seat of injection. The failure of the respiration appears to be secondary to that of the circulation, while the very feeble action of strong solutions of the venom directly on the heart will not account for the facts observed, including the pumping up of the blood-pressure with the occurrence of respiratory convulsions and well-marked and persistent Traube-Hering curves, as in with the other viperine venoms. In this case, again, the dilatation of the vessels of the portal circulation, coincidently with the general fall of blood-pressure, has been both observed under the microscope and demonstrated with the oncometer. Further, artificial respiration fails to improve the circulation after respiratory failure, while, in the primary respiratory failure of Colubrine poisoning, it is most effective.

II. *Trimensurus anamallensis*, the Indian representative of the Rattlesnake class, has also been

examined (thanks to the kindness of Dr. W. Dowson), with precisely similar general results to the others, the same vaso-motor paralysis being induced by a small single intravenous dose without any intravascular clotting, as in the case of the Rattlesnake, while, in larger doses, it kills with intravascular clotting like the true vipers. It has much less effect in causing hæmorrhages than either the Rattlesnake or the puff adder, but less than the Daboia.

Thus we find from a comparison of the action of these four vipers that while in the case of the two pit vipers a primary circulatory failure, quite independent of any intravascular clotting, can be readily induced by a single intravenous dose of the venoms, the same result can also be brought about in the case of the two true vipers by first producing the negative phase of reduced coagulability by preliminary small doses of the venoms. Further, there are cases on record of complete loss of clotting power for several days in which ultimate recovery took place, while the hæmolytic changes, which are produced by all these venoms, are not of lethal intensity. The failure of respiration is always secondary to that of the circulation, while none of these venoms have any marked direct paralysing action on the heart which could account for the circulatory failure.

On the other hand, we find a complete paralysis of the vaso-motor centre in the medulla is common to all these venoms, and will fully account for the lethal effects found, although in some of them the hæmorrhagic effects will greatly aid it. If my conclusion is correct that the essential action of the viperine poisons as a class is a paralysis of the central vaso-motor centre, just as the Colubrine class paralyse the respiratory centre, then it would appear to be possible to produce an antivenin against the former venom on the same lines as Calmette's serum against the Colubrine class, a mixture of viperine poisons being used for injections. In the meantime such drugs as adrenalin extract and nicotine, together with cardiac tonics, may be of material value in doubtful borderland cases in keeping up sufficient blood-pressure to insure a sufficient supply of blood to the medulla to maintain the respiratory centre working.

Review.

Modern Methods in the Surgery of Paralyses.—By A. H. TUBBY, M.S. (LOND.), F.R.C.S.; and ROBERT JONES, F.R.C.S.E. MACMILLAN & Co., London, 1903. Pp. 311, 93 Illustrations. Price 10*s*.

CONGENITAL and acquired forms of paralysis have usually been left in the hands of the family physician, supplemented by occasional visits to the nerve specialist or the shop for orthopædic appliances; and the treatment has been on the routine lines of electricity in some form, massage, hydrotherapeutics and nervine tonics. Hitherto the ordinary surgeon has shunned this class of case as much as the patient has avoided the surgeon. Of recent years, however, the confines of surgery have been extended in a variety of subjects, and this work by Mr. Tubby and Mr. Jones is an excellent example of what can be accomplished by muscle-grafting, tendon-transplantation and arthrodesis, both for the the paralysis and for the deformity resulting therefrom.

The first chapter contains a comprehensive review of Infantile Paralysis. The infective theory of its origin is favoured, also Goldscheider's view of the inflammatory lesion chiefly involving the area of distribution of the central branches of the anterior spinal artery: and certainly this best accounts for the subsequent retrogression of the paralysis. The two types of infantile paralysis—spinal and cerebro-spinal,—are duly recognised.

The authors accept the suggestion of Gossage that there may be three or more diseases which are grouped together as anterior poliomyelitis, *viz.*—(1) The type with sudden onset of paralysis without any antecedent symptoms. (2) The type in which the onset of paralysis is preceded by fever, vomiting, pain in the back and other general symptoms. (3) The epidemic type, in which the brain and distal nerves may be involved. (4) The adult type as distinguished from the infantile and puerile. They also believe that the rapid recovery of the majority of muscular groups that have been paralysed points to pressure upon the nerve elements and cells rather than to a destructive inflammation. Their observations incline them to believe that girl children are more often affected than boys, whereas in poliomyelitis after puberty the disease is much more frequent in males. The lower extremities are most frequently involved, and in them especially the peronei; in the upper limbs the deltoid is most commonly attacked. The resulting deformities are due to trophic changes and to mechanical causes following paralysis. The rate of growth is not dependent upon the degree of paralysis, and in some cases lengthening may result instead of shortening; but the arrest of growth is proportionate to the growth rate, *i.e.*, the younger the child affected the greater the shortening. Most of the deformities, however, are due to mechanical causes following paralysis. The authors attach no importance to the theory of antagonistic muscles, they acknowledge unbalanced muscular action as an etiological factor, but they lay most stress on the effects of gravity and of body pressure, especially superincumbent weight in the case of the lower limbs.

In their opinion the prognosis of infantile paralysis as to complete recovery of every affected muscle is not good; but there is no case which cannot be benefited by one or all of the surgical procedures available. The recovery under proper treatment exceeds all anticipation. Treatment should be commenced as soon as possible. For the first few days medical treatment should be directed to reducing the fever, and after that surgical means must be adopted

to prevent or to correct deformity. Massage and warmth should be first used, and then voluntary movements and massage, and the limb must be kept in a position opposed to the deforming tendency. Walking should be encouraged as soon as the child desires to try. The great stumbling-block to treatment hitherto has been the failure to distinguish the loss of power caused by a destruction of motor cells from that due to muscular contracture. In suitable cases there is no time limit, however late, at which treatment is of no avail. The clinical test they adopt for prognosis is simple. If spasmodic movements occur, in a case of drop wrist for example, on a voluntary attempt at opening the fingers, then mechanical means will be only partially successful. If the patient can only extend the fingers by simultaneously moving those of the other hand, then the case is hopeless. If the fingers respond by the faintest quiver, and the surgeon further contracts the hand, and the fingers are then at once moved back to their former position, such a case will almost certainly recover. The extensors which react with most strength on forcible contraction by the surgeon will recover soonest. The treatment takes from six to eighteen months as a rule. Contractures must be overcome before opposing muscles can act properly, and elongated muscles are quickest restored to power by maintaining them in a slackened posture.

The second chapter deals with the treatment of infantile paralysis affecting the upper extremity and the spine; whilst the following three chapters are concerned with infantile paralysis of the lower extremiites, and its treatment by tenotomy and mechanical means, by tendon-transplantation, and by arthrodesis, osteotomy and cuneiform exsection. A large number of illustrative cases are incorporated in the text. The directions for tendon-transplantation in all the varieties of talipes are given in full detail. The authors have found that the wounds heal well and quickly, and suppuration occurs less frequently than in healthy limbs,—a most important feature where success virtually depends on primary union. "Tendons practically never fail to unite after section, and bones join without delay. This, when we consider that the limb has been deprived either partially or entirely of trophic control, is an interesting clinical fact to those largely engaged in the treatment of paralytic deformities."

The second section of the work is devoted to spastic paralysis and its treatment by mechanical, operative and educational measures. According to the authors the treatment of spastic paralysis has been too long exclusively medical for much real progress to be made. They have grappled with cases of this disease, apparently hopeless and uninviting to the surgeon, and have met with a fair amount of success. Their conclusion is that a large proportion of children suffering from severe spastic paralysis may be transformed into useful members of society by surgical aid. For the upper limb, which is usually more seriously affected than the lower, they have devised two operations to counteract the spasmodic and deformed condition of the hand and forearm. The one aims at transforming the excessive action of the pronator radii teres into a supinating power, and the other seeks to reduce carpal flexion by converting the carpal flexors into carpal extensors.

The third and last section deals with a variety of paralyses, but the exigencies of space permit merely of a list of these being mentioned here, *viz.*, paralysis from fractures, dislocations and section of nerves; ischæmic paralysis from tight bandaging, malposition, and excessive callus-exudate; multiple neuritis, lead palsy, locomotor ataxia, Friedreich's disease, progressive muscular atrophy, peroneal paralysis, spina bifida, syringomyelia and compression paraplegia are all briefly discussed.

The book is one which deserves the attention of physicians and surgeons alike, especially of the latter in suggesting to them operative procedures for the benefit of an unfortunate class of cases which has too long proved a source of despair and discredit to the profession at large.

Aids to Chemistry.—By T. A. HENRY, D.S.C. (LOND.). Bailliére, Tindall and Cox, London, 1903. F'cap 8vo, pp. 316. Price 4*s.* 6*d.* Eighth Edition.

THIS little book is just what its title professes. It is a useful help to the junior student, because the explanations are simple and lucid; it is an aid to the senior student in revising for an examination, because much information is condensed into small compass. The new edition has been entirely re-written so as to bring the subject-matter up-to-date, and so as to enable students to systematise the information they obtain from their lectures and text-books. Subjects such as the constitution of matter, formation of chemical compounds, properties of gases, determination of atomic weights, classification of the elements, chemical calculations, identification of salts, the detection of the acid radical, are treated in a masterly fashion by one who knows how to teach. The subject of organic chemistry is dealt with even more fully than the part treating of inorganic chemistry, and a uniformly high level is maintained throughout. The publishers have produced a handy little book printed on good paper and in clear type, with a satisfactory index.

EXTRACTS FROM MEDICAL JOURNALS.

MEDICINE.

Under the heading of **Chronic cyanosis, with polycythæmia and enlarged spleen: a new clinical entity**, Osler describes, in the *American Journal of the Medical Sciences* for August 1903, a series of nine cases with the above general characteristics. The patients were six males and three females between 35 and 53 years of age with varying occupations.

The cyanosis had been present for from three to ten years, and the patients were of a dusky hue all over, with suffused conjunctivæ and prominent eyes, the cyanosis varying in degree, being more marked in cold weather, and aggravated by any existing catarrh of the bronchi, and being less on bright clear days. There is no dyspnœa with the cyanosis in these cases, nor is there distention of the large superficial veins, though a close examination of the skin shows that there are many fine dilated venules.

The blood is very viscid, being unusually dark and sticky; in eight of the cases the red blood corpuscles were above 9,000,000 per c. mm, the maximum being 12,000,000 per c.mm., while in the ninth case the numbers were 8,250,000 per c.mm. The percentage of hæmoglobin has been high, ranging from 120 to 165; the specific gravity has been between 1067 and 1083; and the leucocytes from 4,000 to 30,000, but usually being below 10,000 per c mm.

The spleen was enlarged in seven cases, the liver in one. The urine contained in seven cases, a trace of albumen, with hyaline and sometimes granular casts, in two cases its condition was not noted. Its specific gravity was low.

Pigmentation of the skin was present in several of the cases. The symptoms have been very varied; most have headache, weakness, prostration and vertigo, with constipation, and pain in the back and abdomen. Sometimes there is nausea and vomiting, and in one case only cough and shortness of breath. There is high tension with sclerosis of the arteries, but no œdema; there is no fever.

Three cases were fatal; one died in collapse after a few hours of drowsiness, the autopsy showing a normal heart, moderate emphysema of the lungs with cyanosis and œdema and moderately enlarged spleen; the second died comatose with cerebral hæmorrhage, and the autopsy showed hæmorrhage from the middle cerebral artery and passive congestion of all the viscera; the third became drowsy and died in coma, and showed on examination hypertrophy of the left ventricle with congestion of the brain.

Osler makes the following comment on these cases:—

Chronic cyanosis is a common feature in organic disease of the heart, in certain lung diseases, especially emphysema, and in methæmoglobinæmia of chronic poisoning with coal-tar products such as antipyrine and acetanelid. There may be local cyanosis of the face and hands in cold weather in the type of man exemplified in the English dray-man and in Raynaud's disease. Cyanosis, local or general, indicates one fact,—diminished oxygenation of the red blood corpuscles. In all these cases just mentioned there is no polycythæmia, either in blood taken from the cyanosed part or from some distant point.

Polycythæmia is of two kinds, relative, in which there is a diminution in the quantity of the plasma; and true, in which there is an actual increase in the number of the red blood corpuscles. Relative polycythæmia is very common and may be due to diminished ingestion of fluids or to an increase in their loss, as in the new born, in excessive diarrhœa, sweating, diuresis, during ascites, probably in poisoning by phosphorus and carbon monoxide, and in the polycythæmia following a cold bath. The polycythæmia of high altitudes being accompanied by microcytes, poikilocytes, and nucleated red blood corpuscles is probably a true polycythæmia.

True polycythæmia is met with where there is difficulty in the proper aëration of the blood as in high altitudes, in heart-disease, especially in the congenital form, and in the disease under consideration. It is regarded by Vaquez and Quiserne "as a mode of adaptation to the new conditions, and a sort of functional reaction of the organism."

Osler gives a short description of two cases in which there was great tubercular enlargement of the spleen; in one there was cyanosis without polycythæmia, in the other polycythæmia without cyanosis. He goes on to say that before discussing this remarkable group of cases we need a much more careful and accurate examination of cases of cyanosis than has been carried out; that this will determine whether we have really a new disease or not, and that though the clinical picture is certainly very distinctive, the symptoms are somewhat indefinite, and the pathology quite obscure.

In the *Boston Medical and Surgical Journal* of September 24th, Dr. J. P. Briggs records facts which point to a further practical usefulness of the Riva Rocci clinical manometer. They go to show that before symptoms of perforation show themselves in typhoid fever there is a sudden rise in blood pressure, that is to say, that this sign is the first change which takes place when perforation take occurs. In one case a sudden rise of pressure from 108 to 144 mm. of mercury gave warning four hours before pain or other symptoms of perforation occurred. The scope of usefulness of this instrument promises to enlarge with further knowledge.

Further information will be anxiously awaited on the subject of Dr. Otto Schmidt's specific treatment of cancer, an address on which was delivered by Dr. H. Jossé Johnson before the Abernethian Society at St. Bartholomew's Hospital on November 5th. Dr. Schmidt holds that all the parasitic bodies described in cancers are one; he states that he has cultivated them outside the body (though in what way has not been explained); that he has produced tumours in mice from the inoculation of this pure culture; that the inoculation of these pure cultures sterilised at 65° produces an autogenous or active immunity, and that the serum of the animal so rendered immune is capable of conferring an allogenous or passive immunity when injected into another animal. The immunity is a curative one and has not been tested as a preventive. Its reaction reminds one strongly of that of tuberculin. When the sterilised culture is injected into a healthy animal or person there is no reaction; when injected into the body of one suffering from either carcinoma or sarcoma it produces a rise in temperature with accute inflammation and marked leucocytic response in all malignant tumours and for a wide area all round them, thus bringing to light metastases which were not noticeable under usual conditions. The dose of sterile culture is gradually increased, and the result of the inflamnation so produced is in time the substitution of fibrous stroma for the actively proliferating cellular neoplasm, in fact, an exaggeration of the process of natural cure which is sometimes affected or attempted in cases of so called scirrhus cancer. The fibrous bands so formed may by contraction produce serious deformities and constrictions of the affected parts. It is to be hoped that these facts will be confirmed and the information amplified, and that it will not be found that the attempt to produce autogenous immunity in one already suffering from the disease will have the disastrous effects which followed the injection of the original tuberculin in certain cases. The serum for the production of allogenous immunity has not yet been produced with a sufficiently large number of immunity units per cc.; and here another difficulty confronts Dr. Schmidt, namely, that since the cultures do not produce death, it is impossible to measure by present methods the number of immunity units which it does contain. Some new standard will have to be devised. The paper is a most striking one and furnishes much food for reflection.

CLAYTON LANE, M.D.

FOREIGN JOURNALS.

Entero-colitis muco-membranacea, and its treatment by Doumer's method.—Two cases of this troublesome disease have been successfully treated by de Nobele on the lines laid down by Doumer in 1901. A continuous current of electricity is applied to the abdomen, by means of two electrodes which are in contact with the skin over the fossæ iliacæ, at points as far as possible away from the trunks of the crural nerves and the

excito-motor points for the muscles of the belly-wall. On the electrodes being connected with the source of electricity, the current is rapidly raised by turning a potential-reducer to 50 m.a., and kept at this for a minute. Then, without reducing the current to zero, it is rapidly reversed—this manœuvre causing the patient to experience an abrupt shock, which however "is not as painful as one would imagine." After this reversal the current is allowed to rise in intensity up to 60 or it may be 75 m.a., according to its toleration by the patient. In any event it is not allowed to go below 50 m.a., and after another minute, it is again reversed, the seances lasts for 8 or 10 minutes, the current being reversed every minute, and are repeated daily until the stools become normal, when they may be made less frequent, and finally discontinued when the constipation from which the patients suffer is definitely cured, and remains cured. In cases in which the stools are hard, mixed with false membrane, decolorised, and infrequent, this method of treatment gives astonishingly good results.—(*Ann de la Soc. de Med. de Gand*, vol. 82, fasc. 4)

Fecundity Extraordinary.—At Christianborg on the West Coast of Africa lives a Negress who has added to the population thus:—At her first delivery she bore one child, at her second twins, at her third quadruplets, at her fourth triplets, and lastly six triplets,—five boys and one girl, whose photograph was taken by a missionary, and appears in the *Muenchener Med. Wochenschrift*, No. 38 of 1903.

The Bacteriological Diagnosis of Cholera by means of a special Agar.—In the *Centralblatt f. Buktertologie*, No. 6 of 1903, Hetsch reports that he has found the following modification of Drygalski's agar to be very useful:—

Agar	2	per cent.
Meat extract	1	,,
Peptone	1	,,
Na Cl	½	,,
Milk sugar	1½	,,

To a litre of this medium he adds 130 cc. of a solution of litmus, and a little crystal violet. The differentiation of the cholera colonies may easily be made after ten hours, as they grow blue, while the colonies of *B. coli* are stained red.

Paraffin as a means of correcting æsthetic defects.—A. E. Stein writes in the *Deutsche Med. Wochenschrift*, No. 37 of 1903, that he always uses soft paraffin—of a melting point of about 41° (106°), of which he never injects more than 3 cc. at a sitting, and always of pasty consistency, never liquid—in order to avoid embolism, and, he says, because hard paraffin is only of use in cavities whose walls are well defined, while soft paraffin can be applied to any cavity, and is never absorbed.

The Prophylaxis of Venereal Diseases.—Fraenkel, in a long and exhaustive article on the subject, reports the excellent results which have accrued in the German Navy from the admirals commanding insisting upon "liberty men" being examined on the morning after their day ashore, and having a few drops of a two per cent. solution of nitrate of silver injected into the anterior portion of the urethra, the solution being allowed to remain in the urethra for five minutes, and by pressure with the finger and thumb, brought into contact with the entire urethral wall. After ejection of the solution the person so treated must refrain from micturating for at least half an hour. Fraenkel reports that since these orders have been acted upon even in such centres of gonorrhœal infection as Yokohama, the German seamen have remained free from gonorrhœa. On this point all the naval surgeons are in accord, so it would appear that this method of avoiding sickness and its attendant extra work for those who remain well, is worth the attention of our own naval and military authorities.—(*Muenchener Med. Woch.*, Nos. 38-39 of 1903.)

Adrenalin, subcutaneously, injected, with an anæsthetic, as a blood-stancher.—H. Braun of Leipzig, who has used solution of adrenalin in many hundreds of cases, is convinced that only a very small dose is required to be added to the solution for producing anæsthesia of the tissues. He recommends that 10 cc. of a solution of 2 of Ac. Hydrochl. pur, and 8 of Na Cl in 1,000 parts of distilled water, be added to 1 cg. of *pura* adrenalin. The solution thus obtained should be boiled, and if to it are added a couple of drops of pure carbolic acid, it may be kept for an indefinite period in a brown glass bottle, well-stoppered.

To 100 cc. of a 1—1,000 solution of cocaine or eucaine B 2—to a most 5 drops of this 1—1,000 adrenalin solution may be added, when it is desired to prevent post-operative oozing. This solution of adrenalin does not prevent bleeding from the arteries, which can thus be seen, and caught.

In cases of tooth extraction, or where nerve trunks have to be anæsthetised, Braun considers that the highest concentration permissible is 1—2 drops of the 1—1,000 adrenalin solution per cc. of the cocaine solution.—(*Centralbl. f. Chirurgie*, 38 of 1903.)

An improved method of percussion.—In the *Muenchener Medicinische Wochenschrift*, No. 15 of 1902, Yohann Plesch of Buda-Pest describes the following mode of avoiding secondary vibrations, and thus increasing the precision of the percussion-limits of an organ. *One finger*, preferably the middle finger, is used as pleximeter, being flexed at the proximal interphalangeal joint and *forcibly* extended at the distal joint, the pulp of the finger tip being then placed on the chest, or abdominal wall The percussing finger is similarly flexed and extended, and during the act of percussion its pulp strikes the pleximeter finger in the axis of the extended two distal phalanges. Plesch claims that this method of finger percussion is much more accurate in its results than any other, and after a trial we can state that it certainly appears to give more accurate results, while it is no more difficult to carry out than the ordinary method.

The Intravenous Injection of Corrosive Sublimate Solutions.—Serafini of Padua, as the result of his experiments, states that he has found that even when a quantity of the sublimate equal to one-three hundred and sixty thousandth part of the body-weight, or one-thirty-thousandth part of the blood-mass of an animal is introduced intravenously, no antiseptic effect is exercised, *i.e.*, microbes introduced into the blood continue to live and multiply.—(*Muenchener Med. Woch.*, 16 of 1902.)

Refractometric Examination of the Blood.—Strubell, working in Neusser's clinique in Vienna, has found that by means of Pulfrich's refractometer the albumen of the blood can conveniently be estimated thus: On the prism *one drop* of serum is placed, then the second prism is set on this, and the refraction of light is read off on the scale. From the reading thus obtained subtract 18 (15 for water, and 3 for the blood salts) and divide the remainder by 4·2—the quotient gives the percentage of albumen. Strubell believes that this is a valuable aid to the examination of blood, etc, by cryoscopy.—(*Muenchener Med. Woch.*, 15 of 1902.)

The absorptive power of the bladder.—O. Cohnheim has made a series of experiments to solve the much disputed question as to the absorption-power of the bladder. He tied the ureters in rabbits, and then injected various fluids into the bladder by means of a Nélaton's catheter. He found that the *intact* vesical mucosa shows no absorptive power; but that absortion takes places whenever the epithelial surface of the mucosa is injured.

W. D. SUTHERLAND, M.B., I.M.S.

DISEASES OF WOMEN.

Conservative Vaginal Cæsarean Section for Uncontrollable Vomiting of Pregnancy.—Ehrendorfer (*Centralbl. f. Gynak., Leipzig*, 1903, *No.* 16) reports the following case:—Patient, *æt.* 23, had been treated for vomiting and salivation from the third to the fifth month of pregnancy without effect. Attempts to dilate an indurated cervix by tents having failed, the uterus was emptied by vaginal Cæsarean section, the anterior uterine wall being alone split up. He refers to a similar case reported by Spinelli; and points out that, in delivering premature children by this method, it is unnecessary to disturb the posterior uterine wall. Ehrendorfer's patient made a satisfactory recovery.—[*Edinburgh Medical Journal.*]

Vaginal Cæsarean Section for Eclampsia.—Duhrssen (*Centralbl. f. Gynak., Leipzig*, 1903, *No.* 16) refers to thirteen cases treated by this method, published by Bamm, and reports the following case:—Patient, *æt.* 25, 1-para, complained at the eighth month of dimness of vision, headache, œdema followed by five well-marked eclamptic fits. The cervix barely admitted a finger. Duhrssen performed vaginal Cæsarean section turning and extracting a healthy living child. He warns against the use of forceps, and recommends dividing both uterine walls when extracting a full-time child by this method.—[*Edinburgh Medical Journal.*]

Post-Mortem Cæsarean Section.—Weiss-wange (*Centralbl. f. Gynak., Leipzig*, 1903, *No.* 110), was summoned to see a primipara, and on arrival found that she was dead. He performed Cæsarean section, and delivered an asphyxiated child, which was resuscitated with difficulty. Nineteen minutes elapsed between the death of the mother and delivery of the child. Pingler has recorded the delivery of a living child twenty-four minutes after the death of the mother.—[*Edinburgh Medical Journal.*]

Hysterectomy for Puerperal Infection.—A discussion of the indications for hysterectomy in puerperal infections by Duvet (*Journ. d. sc. med. de Lille, April* 1903), led him to the following conclusions:—Septicæmias with evident local lesions in or round the uterus and appendages are often amenable to uterine disinfection, curetting, or hysterectomy. Septicæmias without any apparent local lesions—these may be acute or chronic. Amongst the acute are some caused by placental infections which cannot be relieved by the curette, and in which abdominal or vaginal hysterectomy gives good results. In others, extreme virulence of the causative bacillus is the characteristic and grave feature. In such cases, it is doubtful if removal of the uterus will be efficacious, if transfusion by normal saline solution does not cause some improvement. Chronic septicæmias are the result of phlebitis or peri-uterine lymphangitis. Under those circumstances, there are often multiple foci in the uterine muscular tissue and afferent and efferent vessels. The septicæmic symptoms usually begin after labour, and last several weeks. Abdominal or vaginal hysterectomy may be useful, specially if performed early. In all cases of puerperal septicæmia, the best remedy is large intravenous or subcutaneous transfusion of normal saline solution with uterine disinfection as an adjuvant.

Cocq (*Gaz. de gynec., Paris, April*, 1903) believes that hysterectomy is indicated in acute puerperal infection when the following conditions co-exist:—Probable or existing severe toxæmia, the uterus being the principal septic focus and the source of general infections; failure of other lines of treatment, and ability of the patient to withstand the shock of operation. Those conditions are found in cases of decomposition of retained placenta not removable by the curette, suppurative gangrenous metritis, or large tumours which, having been compressed during labour, may slough. More doubtful indications are acute general streptococcal infection; in such cases, hysterectomy may or may not be beneficial: pyæmia, in which extirpation of the ovarian or hypogastric veins containing a septic thrombus, may be followed by cure. In cases with extension of the inflammation to the parametrium, appendages, or pelvic peritoneum, with severe local symptoms, but with good general conditions, and slow course of the disease, it is well to employ ice and opium, and to open and drain suppurating foci, and to reserve removal of the appendages or uterus till later, if found necessary.

Pinard (*Ann. de gynec. et d'obst., Paris, April* 1903) summarises his views on this subject as follows:—He states that, leaving out of consideration the rare and well-determined conditions—placental retention, putrefaction of a uterine fibroid tumour, rupture and inversion of the uterus—which may require hysterectomy, neither symptomatology, bacteriology, nor pathology can at present furnish an indication for hysterectomy in acute puerperal infection.—[*Edinburgh Medical Journal.*]

Ruptured Extra-Uterine Pregnancy with Symptoms of Intestinal Obstruction.—F. B. Jessett, F.R.C.S. (*Medical Press*, May 6th, p. 450).—A woman, aged 37, was admitted to hospital on January 5th, complaining of severe pain above the umbilicus and inability to "pass anything." The bowels had not acted for three days. On the previous day she was seized with acute pain in the umbilical region. A practitioner diagnosed diaphragmatic pleurisy. She had one labour nine years before. Since then menstruation had been regular until the last period but one, which was missed. The last period came on a month before admission, after an intermenstrual interval of nine weeks. No clots or pieces of membrane were passed.

She lay on her back with the legs drawn up. The expression was anxious. The temperature was 97° and the pulse very feeble. She complained of severe pain across the abdomen. There was incessant retching, and liquids taken were immediately vomited. The abdomen was much distended and tympanitic, especially over the region of the colon. Below the umbilicus on the left side a sense of resistance was felt. Small doses of opium were administered and hot fomentations applied. Castor oil and turpentine enemata brought way small fæculent pieces, but no flatus was passed, and she was very collapsed. The chief pain being referred to the umbilical region and cæcum. Nothing was felt in the vaginal fornices. Colotomy was undertaken. On opening the abdomen much dark blood and blood-clot escaped. Adherent to the uterus on the left side was a mass which proved to be a ruptured tubal gestation. The intestines were enormously distended, and protruded from the wound impeding the view. A long O'Byrne's tube passed into the rectum emptied the colon of a quantity of liquid fæces and flatus. The tube was ligatured and removed with the fœtal gestation and ovary. A difficulty then arose with the small intestines, especially the jejunum, which was distended and protruding; in fact, large coils of intestine were lying on the abdominal parietes. As they could not be reduced without using considerable force a small incision was made, and the contents were let out. The opening was then washed out. The patient was very collapsed and died during the night.

It is noteworthy that a normal menstrual period occurred four weeks before the attack, and that the pain was above the umbilicus instead of, as is usual, in the lower abdomen. When the writer saw the patient, the symptoms pointed to intestinal obstruction. He does not think that the obstruction could have been due to pressure of blood clot on the colon. Probably the contractile power of the bowel was lost, owing to shock and loss of blood, or to pressure on the splanchnic and sympathetic nerves. Hence the possibility of hæmorrhage must be remembered when there are symptoms of intestinal obstruction in a woman. Few such cases have been recorded. One has been reported by Mr. Rutherford Morison.—[*Medical Review*, August.]

J. W. F. R.

SPECIAL SENSES.

IN a paper in the *Boston Medical and Surgical Journal* Hammond, of Boston, discusses recent progress in otology. The importance of not delaying operation too long in **Acute mastoiditis** is emphasized by Bliss. Pain over the mastoid, œdema there, and high fever, persisting for some days indicate the necessity of opening the cells. Cases were recorded during the year, however, showing that the absence of high temperature is at times of absolutely no value as an indication of the necessity of operation. Once more the essential difference in an otitis coming on during or after influenza from other kinds of otitis has been laid stress upon (Goldstein). In such cases the mastoid is invaded simultaneously with the middle ear, and early and free incision of the drum is necessary. The cells at the base of the zygoma are regarded by Whiting as the cause of many cases of recurring mastoiditis, and their removal is advocated in all operations in that vicinity. In chronic catarrh of the middle ear as might be expected from what we know of the drug, thiosinamin has been found useful. Randolph, a careful observer, has found the catarrh distinctly benefited by half-grain doses given three times a day. Larger doses caused vertigo. It was especially useful in cases of tinnitus. It has also been given hypodermically. The drug is said to cause absorption of cicatricial tissue and leucocytosis. The present abstractor has used it in cases of leucoma corneæ, locally applied and given internally, with fair but not brilliant results. Possibly the massage necessary—it was used as an ointment—might account for the improvement observed. The dismal results in many cases of catarrhal deafness make a trial of this drug well-worth the making. Co-existing chronic tuberculosis, malignant tumours, and scars after laparotomy supporting the abdominal organs, are contra-indications to the use of thiosinamin. Harris (*Arch. f. Ohrenh.*, June 1902) came to the conclusions (1) that we have made very little progress in treating chronic catarrh of the middle ear; (2) that our chief success to-day rests in our ability in setting aside the producing nasal catarrh; (3) that tubal therapeutics and pneumo-massage are at the best too often of temporary benefit and in the hands of some even of decided harm; (4) that all we can promise with safety is to check the deafness; and (5) that prophylactic measures are of the greatest value, especially the removal of the ever-present adenoids. The pessimism of these conclusions is confirmed by the varied assortment of treatments being constantly introduced. The use of super-heated compressed air, dosing with bone marrow, electrolysis of the Eustachian tube, passing rubber sounds into the Eustachian tube, exploratory tympanotomy, operations on the turbinates, &c., &c., all have their enthusiastic supporters and vigorous opponents. Meanwhile the surgeon who does not ape the quack will consult his patients' best interests by continuing to use the methods of treatment that are approved by those best qualified to judge in such a difficult matter.

At the 14th International Congress of Medicine in Madrid, April 1903, *Fernandez*, of Cuba, read a paper on diseases of the eye in a warm climate. He especially observed purulent ophthalmia and trachoma, affections of the lachrymal passages were rare, and Fernandez attributes this to the larger size of the nasal canal in the negro. Cataract was not more frequent than in other countries. Cinchonal amblyopia was not rare. Glaucoma presented no especial frequency. H. was common, M. very rare. (*Recueil D'Ophtalmologie*, July 1903). At the same Congress Blanco (Valence) related 24 cases, in which he had performed **Sclerectomy**. Five were cases of absolute glaucoma, one opaque staphyloma, and the rest cases of corneal staphyloma, where the staphyloma was painful and so large that the lids did not cover it. He thinks we have in it a powerful method of ocular filtration capable of employment in all cases where there is hypertony. It is in short a conservative operation avoiding the necessity of amputation and enucleation.

Antonelli (Paris) contributed a comprehensive review of optic neuritis in the course of various acute affections,—influenza, syphilis, enteric fever, meningitis, erysipelas, variola, diphtheria, &c., and described the chief characteristics of the neuritis as met with in each general treatment should be that of the disease. Locally Antonelli found pilocarpin very useful. Injections of strychnine and Cheron's serum were also recommended by him.

At the Mexican Ophthalmological Society in March 1903, *Troncosco* made a contribution to the **Pathogenesis of cataract** as a result of his examination of the aqueous humour in nine cases. Three were commencing cataracts, five ripe, and one hypermature. Of the three incipient, two were nuclear and one cortical; in the former, the proportion of mineral substances were increased to 29.37 p. c. The organic matter was normal. In the commencing cortical cataract, on the other hand, the mineral substances were normal. In the ripe cataracts both organic and mineral matters were normal. According to the author this negatives the idea of Deutschmanux and Leber that, during the formation of cataract, there is an increase in the quantity of albumen; that is only found in glaucoma and in very ripe cataracts. His observations do not much confirm Professor Peter's idea that throughout the formation of cataract there is an increase of saline matter in the aqueous humour, in this increase is due to a special affection of the secretory epithelium of the ciliary processes.

It appears reasonable to admit with Dr. Troncosco that the increase of salt early in cataract causes an abstraction of the water of the nucleus, and that at the moment when this diminishes the cataract begins. New investigations are required upon this point. (*Recueil D'Ophtalmologie*, October 1903.)

Hurd reports a case of **injection of Paraffin** for saddle-nose, followed by blindness from embolism of the central artery of the retina. Two injections were given with good effect. A third was then given, first towards the tip of the nose, then towards the base. At this moment the patient rubbed his eye said he could not see well. A trifling ecchymosis at the seat of puncture soon showed that a vein had been injured. Examination of the eye showed large pupil without reaction, vision *nil*. Retina transparent, veins normal. Inferior artery visible, superior still contained a little blood, but divided into sections. Digitalis, nitrite of amyl and compression of the eye employed. Typical appearance of papilla and macula came on in three hours. No amelioration obtained. The author considers there was an inter-auricular perforation allowing the passage of a foreign body from the venous to the arterial system without passing through the lungs.

F. P. M.

ANNUAL REPORTS.

REPORT ON VACCINATION IN THE MADRAS PRESIDENCY FOR 1902-1903.

IN submitting this report Lieutenant-Colonel W. G. King, C.I.E., I.M.S., comments adversely on the arrangement by which the Inspector of Vaccination is at his disposal for only three months in the year. His other duties comprise those of Deputy Sanitary Commissioner, Professor of Hygiene and of Practical Bateriology in the Medical College. The Sanitary Commissioner reports that "the *personnel* of the Vaccination Department in this Presidency is badly paid, badly educated and, by reason of multiple masters, badly disciplined." Captain J. W. Cornwall, I.M.S., acted as Inspector of Vaccination and Deputy Sanitary Commissioner throughout the year. The total primary vaccinations numbered 1,250,762, the re-vaccinations 81,447, giving a total of 1,332,209 cases. Lymph in various forms was used, with the following percentage of success:—Glycerinated lymph 87·4 and 97·3; calf-to-arm 98·5; animal lymph in tubes and plates 97·0; lanoline lymph varying from 88·5 to 95·7. The lanoline lymph prepared at the Bangalore Institute is favourably commented on.

REPORT ON THE ADMINISTRATION OF THE POLICE OF THE LOWER PROVINCES, BENGAL PRESIDENCY, FOR 1902.

MR. CARLYLE'S report furnishes us with some interesting medico-legal material. In Lower Bengal 3,425 deaths were reported as due to suicide, and of these it is noteworthy that 2,301 were females. It is stated that "Cuttack as usual heads the list with 358 cases." Deaths by accidents numbered 33,572, of which 25,185 were ascribed to drowning and to snakebite. Under the heading *Murder by Robbers* it is stated that 14 persons were killed, 5 being prostitutes and 2 children, for the sake of their ornaments and jewellery. Out of this number there were no convictions except in the Sonthal Parganas, where conviction was obtained in 2 cases. The Police investigated 36 cases of *Murder by Poison*, with very unsatisfactory results. In 20 cases the accused were sent up for trial, including 4 pending at the beginning of the year. Acquittal resulted in 11 cases, conviction in 4, and 5 were pending. Of these 25 persons were acquitted and only 5 convicted. Out of 5 cases in which wives killed their husbands while they were carrying on intrigues with other men only 1 woman was hung and the other 4 escaped. "In Noakhali a woman confessed to killing her step-son that she might induce her husband to divorce her. She retracted her confession and was acquitted. In Monghyr a husband and wife killed an illegitimate child of the wife's. They were sentenced to transportation for life. In Purnea a wife, her brothers and others, are believed to have poisoned the woman's husband because he would not maintain her. In Faridpur a woman poisoned her son-in-law because he had become a leper and ill treated her and his wife. In Pabna a man was hung for murdering a child by a woman he had divorced. In the Sonthal Parganas a woman was poisoned because she was believed to be a witch. In Rangpur a man is believed to have poisoned the husband of his paramour." This gives us some idea of how intimately the sexual relations are associated with crime in the East. There were 358 true cases of *Other Murders*, inculpating 603 persons, of whom 172 were convicted. "The majority of the cases were, as usual, due to intrigues with women, to domestic quarrels and to disputes regarding land." Of *Culpable Homicide* there were 255 true cases, and convictions were obtained in 175 out of 275 persons tried. There were 34 cases of *Administering Stupefying Drugs to Cause Hurt*, of which 9 cases involving 11 persons ended in conviction. In only one case is the drug used specified, and this was stramonium. There were 304 cases of *Rape*, most occurring amongst the Muhammadan population of Eastern Bengal. *Murder of Infants by their Mothers* was reported in 27 cases, 11 were convicted, and in 8 cases the mothers committed suicide. The majority of these cases occurred in Bihar, some being due to family quarrels, and others to conceal illegitimate births. Old offenders were traced in 569 cases by the aid of their finger impressions. There are two striking charts for the decennium 1893 to 1902, which show the remarkable increase in Riot, Murder, Culpable Homicide, Dacoity, Burglary and ordinary theft during 1897, which was a year of plague and famine as well as of the Pathan revolt.

ADMINISTRATION REPORT ON THE PERSIAN GULF POLITICAL RESIDENCY AND MASKAT POLITICAL AGENCY FOR 1902-1903.

ALTHOUGH this report deals as usual more with the deeds of turbulent tribes, yet there are some points of medical interest. There was a severe epidemic of small-pox during the summer in Shiraz, and during the winter in Bushire. Cholera was prevalent at Gwadur, Jask and Minab. The measures adopted for the prevention of plague appear to have been satisfactory. Major Wickham Hore, I.M.S., and Captain deVere Condon, acted as Residency Surgeons at Bushire. A new special tariff has been substituted for the former 5 per cent. *ad valorem* duty on import and exports. Export duties have generally been abolished; but the duty on opium, which is the most important export from Persia, has been largely enhanced. Amongst the imports both Indian tea and Manchester cotton goods are adversely affected.

Correspondence.

NIGHT-MARES AND SOME OF OUR DREAMS.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—No theory seems to have been arrived at to account for such of our dreams from which we invariably awake with some unpleasant sensation and a vivid remembrance of the dream. Indigestion and mental worry are the two causes given, but no explanation has been offered as to how indigestion acts.

From observation on myself, I have come to the conclusion that when any part of our body requires our immediate attention, we are made aware of the state of the particular part of our body through a dream, the nature of which differs in accordance with the particular part of the body, requiring our care, and the nature of our impressions in the waking stage. The latter must vary in accordance with one's occupation, and mental development, &c. In every case, the dream must be vivid enough to awake us, and as the impression of different scenes is different on different persons, the nature of the dream will vary widely; only two facts will be common to all; first, that it must produce enough impression to awake us and, secondly, that the dream must be in connection with the part of our body in need of our attention; so that the first thing to attract our attention on awakening may be the particular state of our body, which in fact is the cause of the dream.

The following two instances will make the theory quite clear.

One night I dreamt that I was performing a *post-mortem* examination on a body in an advanced stage of decomposition; the smell and sight were so offensive as to make my very hair stand at an end, and the impression was so intensely unpleasant that I awoke. On awakening the first thing to attract my attention was that I was feeling cold and on account of that, my hair was actually standing at an end. This occurred at Aden, where, on account of the intense heat, one has to sleep almost in a nude state and in open. Besides there a sudden cold breeze is of common occurrence. On account of the heat, one perspires, and the cold breeze, though momentary, acts on sensitive bodies and makes one feel the want of some covering.

Next time, I dreamt I had by accident drunk some kerosine oil and, on that account my throat was parched and the discomfort awoke me. My first impression on awakening was that I was very thirsty, and it was true. This also occurred at Aden.

In both cases, the body required attention, and the dream was such as to give the right idea of the state of the body; only the ways of giving such a knowledge were different.

Now in my case both the dreams were pertaining to impressions that referred to my profession. People of different professions will therefore have different dreams, though the cause may be the same.

It may be mentioned that I had not any occasion to make any *post-mortem* for more than one year about the time I dreamt the above dreams, nor had I an occasion to treat a case of kerosine poisoning.

From the above remarks, it will be clear why indigestion produces what is called night-mare. The abnormal condition of the stomach must act sympathetically on the heart, and to give a correct idea of such a state, varieties of dreams would be the result, as the heart is affected by a variety of impressions. Two facts, however, are common. First, that it is necessary that one should be awake, so that the digestion may be assisted, and, secondly, the dream gives a definite idea of where the derangement is and which part is in need of our care in the waking state.

In the same way, if one is lying on his back and with his hand on his chest, the dead weight of the hand in sleep tires the muscles of the chest supporting the hand, after some time, and the result is that a dream probably of suffocation from some cause would be the result or some other dream which would attract the attention to the discomfort in the chest.

In fact, there is as if it were a sentinel who watches most keenly over the body and on the least necessity awakes us by enacting such scenes as may be associated together from the past stored-up impressions and of a sufficient intensity in feeling as to awake us.

What the sentinel is and where it is exactly located are questions which must be left for being solved by experts.

V. D. MERCHANT,
Asst. Surgn.,
in charge Sirsi Dispensary.

THE PUFF DIRECT.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Last month Captain Cornwall, I.M.S., under the heading of *A Question of Medical Ethics*, drew attention to "the appearance of highly objectionable paragraphs of an appreciative nature from time to time in the columns of the daily press, such as would be the ruin of a practitioner in England. The subjects of these paras or articles are frequently in no way responsible for them; editors are alone to blame for inserting them." I enclose a case in point which seems very apposite to this subject, culled from a leading article in the Calcutta daily paper, *The Statesman*, of the 28th November.

"We may add that an interesting light is thrown upon both the prevalence of blindness from cataract in the Punjab and the extent to which it is being alleviated by modern surgery, in a paper read before the Ophthalmic Section of the British Medical Association this year by the Major Henry Smith, M.D., I.M.S., of the Civil Hospital, Jallundhar. He spoke from a personal experience of over 8,500 operations for cataract. His operations during the first four months of this year alone amounted to 1,083, and it was not an uncommon experience for him to perform forty or fifty operations in a day. Still more remarkable than the extent of his *work is the high standard of success, for more than 99 per cent. of the operations resulted in cures.*" Comment is needless, so I remain,

Sir,
Yours faithfully,
ADVERTISEMENTS.

CIRCUMCISION: MIDWIVES AND 'THE MINOR OPERATION.'

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—For many years I understand nurses being trained as midwives in one of the hospitals in India have been taught to perform what they call 'the minor operation' upon new born male children. This consists in drawing back the fore-skin until the glans is completely exposed and then replacing it. However tight it may be, the nurse struggles to effect her object, and not uncommonly it takes twenty minutes or half an hour's hard struggle, the babe howling hard from the pain all the while. The distressed mother is reassured by being told that this 'minor operation' is necessary, that it will obviate any future necessity of circumcision, and that the smaller the opening and the worse the struggle the greater the necessity so as to prevent danger from difficulty in micturition. In fact she is given to understand that should a child ever require circumcision, it is the fault of the nurse who at birth must have failed to perform the 'minor operation.'

Now, Sir, I would like to ask the opinion of your readers as to the necessity or advisability of this proceeding. To me it appears unsound for the following reasons:- (1) Absence of any proof that such children require circumcision less frequently in after years; (2) Futility and unscientific nature of the proceeding. If the prepuce stretches enough to allow of the performance, it contracts again and no benefit results. If it does not stretch but tears then, the proceeding is brutal. It is a cruelty perpetrated not by a surgeon (no *surgeon* would be guilty of it) but by one ignorant of the elements of surgery, and one might as well tear the fore-skin off. Chopping it off would indeed be more effectual as well as more humane. (3) It is objectionable to train any nurse to think herself qualified to perform even such a 'minor operation.' They are eager enough as it is to undertake undue responsibility, and it is unwise to teach them to perform what they regard as 'minor operations,' with the result that they actually blame other less favoured mortals for neglect in not going and doing likewise. (4) Rarity of the necessity for circumcision, quite a small proportion of boys really requiring it. This argument would only hold if the proceeding had any real value. (5) It cannot prevent or relieve difficulty of micturition. If the prepuce has too small an orifice to allow of free micturition, no amount of force (brutality) will draw it back, and a surgeon, not a nurse, is needed. If the orifice is not too small, no difficulty of micturition will ensue, and the 'operation' is not needed on that account.

I have carefully searched text books on midwifery, surgery and diseases of children, without finding any reference to such a proceeding. In my young days indeed a fellow student invented a fearful wonderful instrument, a sort of cross between a mouth-gag and a nose speculum, to dilate the prepuce with and avoid subsequent circumcision, but the fate of his invention was sad and need not be recorded. If there is anything to be said in favour of the practice, will some one kindly inform us. If there is anything, it is sad to think of the billions of babies who have escaped this 'minor operation' since the world began.

SURGEON.

Service Notes.

THE NEW WARRANT FOR THE I.M.S.

THE following extracts are taken from an Editorial in *The Journal of Tropical Medicine*:—

There is, however, one great grievance as yet unredressed, and that is the proviso that no officer can receive any staff allowance in addition to his grade pay until he has passed the "lower standard." Now an officer may be sent on landing in India to an out-of-the-way station where he cannot obtain the services of a Munshi; the "lower standard" is no joke at the present moment, and thus an officer through no fault of his own is mulcted of a part of his pay. Surely it would be more equitable if all young officers on joining be sent to a Presidency town and given an opportunity of passing this examination, whilst at the same time doing duty at the Presidency hospital.

ALTHOUGH the rates of pay are thus increased *the* great grievance of the military side is still unredressed. Officers of the I. M. S. are held to be eligible for the highest post in the Military Medical Service in India, yet not once have they held it, although there are far more native soldiers than British in India. A most flagrant example of this injustice occurred in the case of the late Surgn.-Genl. R. Harvey. This distinguished officer, with a record both on the civil and military sides second to none, and with a large war service both in a subordinate and a directing position, was, if report be true, nominated for the position by the Viceroy, but the recommendation was over-ruled by the authorities at home. The Commander-in-Chief is selected alternately from the British and Indian Services—so should the Medical Head of the Military Services be chosen.

TURNING now to the civil side, one great grievance *must* be rectified, and that is the distasteful order that when an officer attends a native gentleman, the question of the fee must be referred to the Civil authority if it be above a certain (not at all high) limit. Now a native chief as a rule, we believe, *sends* his medical officer his fee without being asked for it. Cannot the Government trust their medical officers not to act as Bunniahs? The Secretary of State should at once order the Indian authorities to rescind this.

Lastly, the Director-General should *ex-officio* be a member of the Viceroy's Council, and the Inspector-General of Hospitals of the various Provinces be similarly members of the Legislative Councils of these Provinces. The Director-General of the R. A. M. C. at home is a member of the Army Board. Why should not the Head of the Indian Medical Service be similarly a member of the Legislative Council at home?

THE services of Major W. R. Clarke, I.M.S., Civil Surgeon, Simla, are replaced at the disposal of the Government of the Punjab.

MAJOR A. J. MACNAB, I.M.S., is appointed Joint Medical Officer of Simla.

CAPTAIN G. J. G. YOUNG, I.M.S., acts as Personal Assistant to the P. M. O., Bombay Command, *vice* Captain J. W. Watson, I.M.S., placed at the disposal of the Government of India, Foreign Department.

LIEUTENANT F. NORMAN WHITE, I.M.S., has assumed charge of the civil medical duties of Wana, relieving Captain F. H. Watling, I.M.S.

THE services of Captain A. Miller, M.B., I.M.S., are placed permanently at the disposal of the Government of Madras.

THE services of Major R. W. H. Jackson, M.D., R.A.M.C., are replaced at the disposal of H. E. the Commander-in-Chief in India.

LIEUTENANT-COLONEL C. P. LUKIS, M.B., F.R.C.S., I.M.S., is placed temporarily on special duty with H. E. the Viceroy.

MAJOR A. W. ALCOCK, I.M.S., C.I.E., has returned from furlough, and has resumed charge of the office of Superintendent of the Indian Museum.

LIEUTENANT-COLONEL S. J. THOMSON, I.M.S., C.I.E., Sanitary Commissioner, United Provinces, to act as Inspector-General, Civil Hospitals, U. P., in addition to his own duties, *vice* Colonel C. H. Joubert, I.M.S., granted leave.

COLONEL C. H. JOUBERT, F.R.C.S., I.M.S., Inspector-General of Civil Hospitals, United Provinces, is granted leave out of India for eight months.

CAPTAIN G. HUTCHESON, I.M.S., Officiating Deputy Sanitary Commissioner, 2nd Circle, U. P., to revert to Banda as Civil Surgeon.

CAPTAIN S. H. WITHERS, R.A.M.C., to the command of the Station Hospital, Benares, *vice* Lieutenant-Colonel A. A. Pechell.

MAJOR R. E. MOLESWORTH, R.A.M.C., six months' leave on medical certificate.

COLONEL W. L. CHESTER, R.A.M.C., to be P. M. O., Peshawar District, *vice* Colonel G. D. Bourke, R.A.M.C.

LIEUTENANT-COLONEL, J. SHEARER, D.S.O., I.M.S., to be Staff Officer, Army Bearer Corps, Punjab Division, *vice* Lieutenant-Colonel C.R. Tyrrell, R.A.M.C.

MAJOR C. H. BEDFORD, I.M.S., has been granted an extension of leave on medical certificate for six months.

DR. N. L. SHELDON has been appointed Chemist to the Cordite Factory, Wellington.

MAJOR, J. B. JAMESON, M.B., I.M.S., Superintendent of Mahabaleshvar, is appointed to be a Magistrate of the second class in the district of Satara.

THE services of Captain E. F. G. Tucker, I.M.S., are replaced at the disposal of the Government of India.

CAPTAIN E. E. WATERS, I.M.S., acts as Civil Surgeon of Puri, and Captain J. W. D. Megaw, I.M.S., in the same capacity at Dinajpur.

CAPTAIN J. E. ROBINSON, I.M.S., Bombay, has been permitted to resign the service.

CAPTAIN J. G. HULBERT, I.M.S., to the officiating medical charge of the 2nd Lancers.

LIEUTENANT G. E. CHARLES, I.M.S., is granted leave for one year.

CAPTAIN H. M. MOORE, I.M.S., is appointed Professor of Materia Medica and Pharmacy, Grant Medical College, Bombay, *vice* Captain T. Jackson, I.M.S.

MAJOR H. C. L. ARNIM, I.M.S., is appointed Deputy Sanitary Commissioner, Gujarat Registration District.

CAPTAIN A. HOOTON, I.M.S., is appointed Deputy Sanitary Commissioner, Sind Registration District, but continues to act as Civil Surgeon, Bijapur.

CAPTAIN T. JACKSON, I.M.S., is appointed Civil Surgeon, Sukkur, *vice* Major Ashton Street, I.M.S., but continues to act as Civil Surgeon, Superintendent, Lunatic Asylum, and Superintendent, Medical School, Hyderabad.

THE services of Captain E. F. G. Tucker, I.M.S., are replaced at the disposal of H. E. the Commander-in-Chief in India.

LIEUTENANT-COLONEL G. DUNCAN, M.B., I.M.S., officiates as P. M. O., Derajat District.

MAJOR R. BIRD, I.M.S., is reappointed to act as Civil Surgeon, 24-Pargannas.

CAPTAIN B. R. CHATTERTON, I.M.S., is reappointed to act as Civil Surgeon of Gaya.

LIEUTENANT J. MASSON, appointed to act as Deputy Sanitary Commissioner, Northern Bengal Circle.

LIEUTENANT N. S. WELLS, I.M.S., is appointed to the charge of the Pilgrim Camp at Chittagong.

CAPTAIN W. V. COPPINGER, I.M.S., is granted privilege leave for three months.

CAPTAIN W. W. CLEMESHA, I.M.S., is appointed to act as Deputy Sanitary Commissioner, Metropolitan and Eastern Bengal Circle.

MAJOR W. D. SUTHERLAND, I.M.S., reverts to Civil Surgeon, 2nd class, on the return of Lieutenant-Colonel J. L. Poynder, I.M.S., and is deputed on special duty to Pachmarhi.

CAPTAIN J. S. S. LUMSDEN, I.M.S., is promoted to the rank of Major.

LIEUTENANT-COLONEL G. A. EMERSON, I.M.S., has been granted an extension of three months on medical certificate.

MAJOR J. M. CRAWFORD, I.M.S., Civil Surgeon, Naini Tal, has been granted leave for sixteen months.

LIEUTENANT W. D. RITCHIE, I.M.S., to hold civil medical charge of Almora, in addition to his military duties.

CAPTAIN W. SELBY, I.M.S., Civil Surgeon, Azamgarh, to be in visiting charge of the Jaunpur district, in addition to his own duties.

LIEUTENANT-COLONEL J. J. Pratt, I.M.S., is posted as Civil Surgeon, Jhansi.

CAPTAIN G. T. BIRDWOOD, I.M.S., is transferred from Jaunpur to Agra, as Civil Surgeon.

MAJOR H. B. MELVILLE, I.M.S., is transferred from Jhansi to Mussoorie, as Civil Surgeon.

MAJOR W. G. P. ALPIN, I.M.S., is transferred from Mussoorie to Gonda, as Civil Surgeon.

CAPTAIN W. YOUNG, I.M.S., is transferred from Gonda to Naini Tal, as Civil Surgeon.

MAJOR W. H. B. ROBINSON, I.M.S., is granted one year's leave.

MAJOR P. CARR WHITE, I.M.S., is posted as Civil Surgeon of Bikaner.

Promotions—Lieutenant-Colonel T. J. H. Wilkins, I.M.S., to be Colonel. Captains R. H. Deare, B. C. Oldham, R. Bird, S. B. Smith, J. S. S. Lumsden, G. H. Frost, E. Wilkinson, G. F. W. Ewens, C. Duer, H. S. Wood, all I. M. S., to be Majors on the Bengal establishment. Captains J. Entrican, W. G. Pridmore, C. Donovan, J. Penny, D. H. M. Graves, C. H. L. Palk, all I. M. S., to be Majors on the Madras establishment. Captain T. W. Irvine, I.M.S., Bombay, to be Major.

Retirements—Lieutenant-Colonel S. F. Bigger, I.M.S., and Major B. K. Basu, I.M.S.

MAJOR R. E. MOLESWORTH, R.A.M.C., is granted six months' leave on medical certificate.

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will **receive 25 Reprints gratis**, if requested.

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BOOKS, REPORTS, &c., RECEIVED.

Report on the Civil Hospitals and Dispensaries under the Government of Bombay for 1902.

The Treatment of Plague with Professor Lustig's Serum. By N. H. Chokay, M.D., Eagle Printing Office, Bombay.

The Past and Present Condition of Jammu Central Jail By B. R. Sawhney, M.B.

Handbook of Diseases of the Ear. By Richard Lake, F.R.C.S. Baillière. Tindall and Cox, London, 1903

A Crusade against Rats. Pamphlet by Dr. E. X. Dias, Poona.

The Causation and Prevention of Malarial Fevers By Captain S. P. James, M.B. (Lond.), I.M.S. Second Edition. Office of the Superintendent of Government Printing, India, Calcutta, 1903.

Aids to Chemistry. By T. A. Henry, D.Sc. (Lond). Baillière, Tindall and Cox. London, 1903.

Fungi, Protophyta and Protozoa. By Major G. H. Fink, M.R.C.S., I.M.S. (retired).

A Manual of Medicine. Edited by W. H. Allchin, M.D., F.R.C.P. Vol. V, Diseases of the Digestive System, Liver, Peritoneum, Kidneys, and Ductless Glands. Macmillan & Co., London, 1903

The Practical Study of Malaria and other Blood Parasites. By J. W. W. Stephens, M.D., (Cantab.), D.P.H.; and S. R. Christophers, M.B., (Vict.), I.M.S. The University Press of Liverpool. Longmans, Green & Co., London, 1903.

ACKNOWLEDGMENTS, COMMUNICATIONS RECEIVED.

Colonel K. McLeod, I.M.S., London; Captain E. O. Thurston, I.M.S., Calcutta; Dr. N. H. Chokay, Bombay; Captain J. W. Cornwall, I.M.S., Madras; Messrs Burroughs, Wellcome & Co., London; Captain H. Innes, I.M.S., Bhagalpur; Dr. Sawhney, Kashmir; Captain R. H. Elliot, I.M.S., Edinburgh; Major Allan E. Grant, I.M.S., Bournemouth; Major E. Jennings, I.M.S., Bareilly; H. H. Fletcher, M.D., Illinois, U. S. A; Major C. Donovan, I.M.S., Madras; Asst.-Surgn H. Sen, M.B., Jessore; Captain S. P. James, I.M.S., Simla; Asst.-Surgn. T. E. Ayte, Gwalior; Major J. E. Pilcher. Pennsylvania, U. S. A.; Dr. E. X. Dias, Poona; Dr. E. A. O. Travers, Selangor; Lieut. R. W. Saigol, I.M.S., Fyzabad; Dr. T. F. Pedley, Rangoon; Captain S. Anderson, I.M.S., Dhubri; W. J. Wanless, M.D., Miraj; Dr. A. H. Milne, Liverpool; Captain Clayton Lane, I.M.S., Calcutta; Dr. Sinnetamby, Colombo; Captain W. H. Cox, Baghdad; Major C. N. C. Wimberly, I.M.S., Fort Lockhart.

Original Articles.

THE BLOOD EXAMINATION OF THREE THOUSAND FOUR HUNDRED CASES OF FEBRILE DISEASE IN BOMBAY.

SEASONAL PREVALENCE OF THE DIFFERENT MALARIA PARASITES.

THE DIAGNOSIS OF THE VARIETY OF THE YOUNG STAINED PARASITES.*

BY MR. ARTHUR POWELL.

THE table before you shows that a definite diagnosis was made by the finding of parasites in 2,652 cases out of a total of 3,413.

These parasites were:—

Malarial Hæmamœbæ	2,542
Spirilla of Relapsing Fever ...	94
Plague Bacilli (out of 117 cases)...	15
Filaria nocturna causing fever ...	1
	2,652

Of the remaining 761 cases in whose blood no parasite was seen a definite diagnosis was made by clinical methods in 551, leaving a balance of 210 cases of fever in which the diagnosis of the cause is uncertain. The majority were probably malarial.

I may say that the greater number of these cases occurred in the Police Hospital, where it is our custom to give no quinine, no matter how like malaria the cases may seem, till parasites have been actually observed. This may seem an improper procedure to some of you, but it is a sound logical one in my opinion, and in practice has the best results. No patient has died since March 1901 among all these malaria cases.

There is a statement frequently made that in the worst cases of malaria we often get no parasites. This is wholly against my experience, except in the case of Black-water fever which some will not admit to be of a malarial origin.

I believe in giving large and continued doses of quinine, and it is most essential before worrying a patient with this drug to know first whether he requires it. Most cases of bronchitis, pneumonia, pleurisy and tuberculosis can be diagnosed without the help of a stethoscope. Nevertheless few of us would care to consult a physician who seldom or never used that instrument in chest affections.

If we may believe the Hospital Reports of this country we find some 55 per cent. of the patients are the victims of malaria. A widely varying proportion suffer from pneumonia, plague, enteric and relapsing fever, tubercle, liver abscess and other febrile diseases. The microscope offers the only certain means of distinguishing these diseases from malaria at the onset. Yet I venture to say, not one in ten of the practitioners of this country can recognise the malaria parasite, and not one in fifty uses the microscope systematically in the diagnosis of malaria.

Hence we frequently hear such remarks about our friends who are ill, as "the doctors think he may have malaria." "It may be malaria or enteric, but the doctors cannot say for some days." "The doctor thinks she has a touch of malaria." "They fear it is plague, but the doctor hopes it is malaria."

I hope I am not rude in saying that in three out of four such cases the doctor has no business to *think*, to *hope* or to *fear*. It is his duty to *know*, and he has neglected the only means of obtaining that knowledge which most truly is power in the case of malaria. I do not say that the doctor must examine the blood in all cases of suspected malaria, but I maintain he should never administer quinine without first making a dry smear of the blood, which can be referred to and examined should the diagnosis subsequently become doubtful.

We know that in many districts of this country two-thirds of the inhabitants harbour the ankylostoma, a worm that can only be expelled by dangerous and poisonous drugs. When we know also that the presence or absence of these worms can in a few moments be diagnosed by the microscope, we must admit that this instrument is, above all others, the most important and essential for the general practitioner in the Tropics.

The elaborate table I have produced when condensed shows that in the past two and-a-half years there has been no great seasonal prevalence of the parasites such as has been remarked in Italy, Algeria, America and elsewhere

The cause of this, if I may be permitted to theorise, is perhaps to be found in the fact that Bombay is a low-lying, badly drained city, with a moist equable temperature, an abundant artificial water-supply, for the surplus of which there are no efficient drains. The result is the presence of tanks, ponds, fountains and puddles which allow of the continuous breeding of mosquitos at all seasons.

SEASONAL PREVALENCE FOR TWO YEARS ONLY.

	Summer-Autumn.	Benign Tertian.	Quartan.	Total.
January ...	77	74	1	152
February	61	50	1	112
March ...	50	69	2	121
April ...	60	59	3	122
May ...	60	72	9	141
June ...	72	64	6	142
July ...	87	132	2	221
August ...	82	140	2	224
September	88	113	2	203
October ...	130	137	2	269
November	139	146	0	285
December	113	108	2	223

* Paper, read before the Bombay Medical and Physical Society, since revised and amplified for publication in the *I.M.G.*

In this table, for the purpose of comparison, I have used the figures for two complete years only.

There were from—

January to June, 22 quartan, 388 tertian, 380 summer-autumn.

July to December, 10 quartan, 776 tertian, 639 summer-autumn.

This table shows a most striking contrast to the Italian and Algerian figures, which had apparently justified the giving of the name of "Summer-Autumn" to the malignant parasite and the fever it causes.

In the Johns Hopkins Hospital in the United States there were in the months—

January to June, 1 quartan, 112 tertian, 8 malignant.

July to December, 4 quartan 1226 tertian, 191 malignant.

The majority of the malignant cases occurring in September and October.

Buchanan gives figures for ten months in the Central Provinces :—

	Quartan.	Tertian.	Malignant Tertian.
January ...	4	3	16
February ...	1	0	12
March ...	1	0	5
April ...	1	0	0
May ...	0	0	0
June ...	0	3	0
July ...	0	3	0
August ...	1	3	10
September	1	39	51
October ... / November ...	No observations.		
December ...	3	5	24
Total ...	12	56	118

The Bombay tables show that in the first six months of the year there were 790 cases; in the second six months 1,425; and that benign and malignant cases increase at much the same seasons. Malignant cases were in the majority in January, February, April, June and December. "Spring" tertians were in the majority in March, May, July, August, September, October and November.

The term "Summer-Autumn Fever" is therefore singularly inappropriate in Bombay.

In the annual reports of our Indian hospitals we have two columns of statistics, "Intermittent" and "Remittent" fever, to fill up. I am in the habit of entering all cases of benign quartan and tertian infection under the former heading, and all "Summer-Autumn" infections under the heading "Remittent."

I am not anxious to justify this procedure, but I may say all benign cases have shown a distinctly intermittent character. The "Summer-Autumn" *Laverania præcox* has often produced a remittent type of fever as well as a distinctly intermittent. As there has not been a death among 1,186 consecutive cases of infection, the name "malignant" has scarcely been earned.

The rarity of quartan fever is noticeable in my tables, and would have been still more striking, but for the fact that there was a curious run of these cases in the last week of April and first fortnight of May this year. In those three weeks I met eleven cases, only five of which were recognisable clinically.

In the United States of America quartan is also rare. In the Johns Hopkins Hospital in seven years there were only 15 quartan infections among 1,618 cases of malaria, a little less than the proportion in Bombay—41 quartan in 2,542 infections.

Crombie says quartan is so rare that he only met one case in all his twenty-two years' service in India. This estimate is too low, and as many of my clients in Assam passed through his hands, I venture to think Colonel Crombie's statement is based on clinical observation rather than on examination of the parasites, and that he must have overlooked some double and treble infections.

—	Quartan.				Tertian.			'Summer-Autumn.'	
	Simple.	Double.	Quartan and Tertian.	Quartan & Malignant.	Simple.	Double.	Total.	Pure.	Tertian.
January 1902 ...	...	...	...	1	28	6	34	27	1
,, 1903 ...	..	...	..	...	32	3	35	44	4
February 1902 ...	...	...	...	...	29	4	33	24	...
,, 1903 ...	1	...	.	.	12	3	15	35	2
March 1902 ...	1	...	...	...	39	3	42	20	1
,, 1903 ...	1	...	...	.	22	2	24	27	1
April 1901 ...	2	1		...	23	1	24	16	1
,, 1902 ...	..	...	...	...	30	2	32	41	2
,, 1903 ...	1	.	..	1	37	7	44	35	3
May 1901 ...	3	.	...	...	25	3	28	14	2
,, 1902 ...	...	..	..	...	31	1	32	39	...
,, 1903 ...	5	1	2	1	26	8	34	18	3
June 1901 ...	2	..	..	1	17	2	19	25	...
,, 1902 ...	3	..	...	...	43	2	45	46	...
,, 1903 ...	1	...	...	...	20	9	29	18	3
July 1901 ...	2	...	...	...	45	7	52	36	4
,, 1902 ...	..	...	1	...	67	7	74	30	1
,, 1903 ...	...	...	1	...	36	15	51	52	4
August 1901 ...	1	...	...	...	54	11	65	47	1
,, 1902 ...	1	...		...	67	7	74	35	...
,, 1903 ...	1	...	1	..	41	11	52	52	2
September 1902 ...	2	...	...	..	59	9	68	48	1
,, 1903 ...	...	...	...	...	40	4	44	39	...
October 1901 ...	...	...	..	..	49	7	56	55	...
,, 1902 ...	..	...	1	1	68	7	75	68	5
November 1901 ...	..	...	...	...	67	5	72	55	3
,, 1902 ...	..	...	...	...	51	13	64	74	7
December 1901 ...	2	..	...	...	38	6	44	50	...
,, 1902 ...	...	...	...	...	48	10	58	55	6
Total Cases ...	29	2	6	4	1,144	175	1,319	1,125	57
Total infections ...	41 Quartan.				1,382 Tertian.			1,186 Malignant.	

I must add that the number of double tertian cases is understated, as I did not always, when only the benign parasite was found, record the various ages of the parasites. It is also probable that a larger number of the malignant cases than the table shows had also benign infection.

Valuable information was obtained in many cases where the blood showed no parasites by the leucocyte count, which often gave rise to suspicion of pneumonia, internal abscesses, filaria and other worms.

Enteric.—Of 29 cases of enteric 24 were natives. Of these two were complicated with malarial infection. Widal's test gave positive results in 21, including those complicated by malaria.

Tubercle.—The list includes 94 cases of tubercle. In all diagnosis was confirmed by finding the bacillus in the sputum. Several cases had malarial fever when admitted; the persistence of the fever after the exhibition of quinine and the absence of hæmamœbæ should always rouse suspicion of typhoid or tubercle. The oft-repeated statement that malaria and tubercle are antagonistic has not the shadow of a foundation in fact.

May I ask those present if they can confirm my experience that in pulmonary tubercle the first symptom the native nearly always complains of is fever?

Certainly in my cases the patients almost all have first come in on account of fever, and only on subsequent enquiry or observation is a history of cough or emaciation obtained. Spitting of blood is very rare among natives in the earlier stages, and in the majority of cases is never seen at any stage. To me this seems a very remarkable fact, especially as in Europeans, either at Home or in India, hæmoptysis is very often the first sign to arouse suspicion.

Of my 94 cases in Bombay two were Europeans; both had early and repeated hæmoptysis. Of 92 natives only four gave any history of blood-spitting.

I think it a very safe estimate to say that nine-tenths of the cases of fever in Bombay, which last ten days or more, are due to either tubercle, enteric or abscess. I do not think the mortality returns of our city by any means afford a good index to the real number of deaths from tubercle, nor do the public, nor perhaps the profession, appreciate what a scourge this disease is in Bombay.

We have had 66 deaths or invalidings from advanced tubercle during the past two years in a police force of 2,400 men, being at the rate of 14 per thousand. The policeman's life is proverbially not a happy one, and doubtless they have more than their share of exposure and hardship. Still when we consider that they are a selected body of men who undergo a careful physical examination when recruited, these facts point to an appalling prevalence of tubercle in this city.

In comparison with leprosy tuberculosis is a much more infective disease and of vastly greater importance from a politico-economic point of view. Leprosy is, however, more offensive from the æsthetic point of view, and by Europeans is seen through the halo of romance in which the Hebrew scriptures have shrouded it.

The census of 1901 shows the absurd figure of 27 as representing the number of free lepers in the city in that year. Yet we have an asylum for the imprisonment of 370 lepers supported by our Corporation, largely assisted by voluntary subscriptions, while for the infinitely more important and contagious disease, consumption, there is nothing.

So does sentiment triumph over practical utilitarian views.

Of the leucocyte count I can quite confirm Christophers and Stephens' observations that the large mononuclear cells are always increased in malaria. To this fact may be attributed the large percentage of cases in which I have found the parasite. If after a search of about ten minutes no malarial parasite be seen, if the mononuclear cells seem increased, I continue my search, but if their proportion be low, I cease to look further.

Leucocyte Count in Chicken-pox.—In nine cases of chicken-pox among the Bombay Police, the proportion of large mononuclear cells has been ascertained, and in all nine found increased, though in none was there any evidence of recent malaria. Seven had been in the force for a year or upwards and never had fever or been admitted to hospital. Two had had benign tertian, six and eight months respectively before admission for chicken-pox.

This is a matter of interest, but whether a series of fortuitous coincidences, or the result of recent latent malarial infection, I am not in a position to state. It would be well if some pathologist in England or other malaria-free country would make leucocyte counts in a few cases of chicken-pox.

Liver Abscess.—I have examined the blood in nine cases, and must confess I got but little help thereby. In most the diagnosis was complicated by a little basal pneumonia, and as this disease also gives rise to an increase of the polymorphonuclear leucocytes, all I could do was to exclude malaria as a cause of the fever.

Filarial Fever.—In one case of prolonged fever of a hectic type, in which there was a slight swelling of the groin glands, I can only attribute the fever to the filaria. The fever lasted four weeks. Widal's test was negative.

Eosinophile increase in cases of Guinea-worm.—Some of the members of this Society may remember that in 1901 I drew attention to the increase of the eosinophile leucocytes in patients harbouring the filaria nocturna. I will now add that a similar, though not so great an increase, takes place in the case of guinea-worm.

A condition of the blood in a case of fever with a swelling near the umbilicus, showing 7·5 per cent. eosinophiles, led me to suspect guinea-worm. This was verified later on by the worm shifting over to the other side of the navel and finally becoming extruded. The pus contained 19 per cent. eosinophile corpuscles. Five other cases of guinea-worm infection were examined, and 4·75 per cent., 5·5 per cent., 7·5 per cent., 8 per cent., and 12·25 per cent. eosinophiles were found respectively. None of these cases suffered from asthma, skin eruption or filaria Bancrofti. Two had intestinal worms, the expulsion of which did not influence the leucocyte count to any appreciable extent.

Plague.—The blood was examined in 117 cases. In 15 of these bacilli were easily seen in the blood smear. I may remark that Romanowsky's stain shows them up well. Several cases of both malarial and relapsing fever have been complicated by buboes. The blood examination has saved them from being condemned to the Plague Hospital.

As regards the recognition of plague bacilli in the finger blood, some years ago, I was very sceptical about the reports of certain medical men, and until within the past 18 months had been unable to personally detect the bacilli except on culture.

At the beginning of this year there was a particular type of septicæmic plague, in which the rule was to find bacilli in every field. Such cases always died in my experience. One case seemed to be convalescent and had a normal temperature for three days, but then suddenly died. Plague bacilli were found eleven days before death.

I can confirm Miss Corthorne's observation that the coagulability of the blood, as a rule, is diminished in plague. It is also diminished in relapsing fever.

Malingering.—Perhaps you will not credit the existence of malingering in such a gallant corps as the Bombay Police. However, you will not accuse me of want of *esprit de corps* when I add that in many cases it has only been detected by the microscope.

If a man comes in saying he has had an attack of quartan or tertian ague, he is sure of a two or three days' holiday in hospital, even in such troublous times for the police as the Mohorrum. It will generally be found that the eve of some such busy or riotous occasion is selected by the malingerer. If you find no parasite and no mononuclear increase in his blood you can, with an easy conscience, send him back to duty.

A more common occurrence is for a sepoy to come in with a clap, a bubo or a chancre which he is too modest to display. He will say, perhaps justly, that he has fever. Very often in gonorrhœa there is a smart fever of 102° or 103° F. on admission which, after a night's rest, falls to normal, and looks like a benign infection of malaria. When no parasites are found with such a temperature it is marvellous how often a bubo or a clap is exposed on removing the *dhoti*.

In 24 cases in which the existence of gonorrhœa or bubo was loudly denied I have been led to a diagnosis by a negative blood examination.

Relapsing Fever.—This disease was very prevalent in Bombay in the years 1900 to 1902, but seems to disappear entirely in the spring of the latter year. However, in June of this year, I again detected spirilla in the blood of a patient who had but one attack of fever. This seems to have been the beginning of a fresh outbreak, as within a month Colonel Collie had some 40 cases in the jail.

I may here point out that there are many anomalous forms of this disease. *There are many cases of relapsing fever, which never relapse*, and such cases are usually recorded under the convenient name of malaria. It is only in hospitals where the blood is systematically examined that these cases are detected.

In its typical form the temperature is continuous, but I have seen some very marked cases of intermittent rise of temperature, particularly in the relapse. In the first attack also a drop to normal or thereabouts on the second day is not rare.

I have seen some most striking cases of tertian intermittence with spirilla in large numbers in the circulating blood while the temperature was high, and wholly absent on the alternate days of remission. One of these cases had benign tertian fever a month or so before the attack of relapsing fever. For this reason during the fever and in the interval he was kept on 20 grains of quinine daily, nevertheless he had a very typical tertian temperature at the time the relapse of spirilla fever was due. No malaria parasites could be found at any time during this fever, though repeated examinations were made. Spirilla were, however, found each time the temperature went up, and absent during the intermissions. See Chart No. 9.

Are we to conclude that the spirilla caused this intermittent fever? Or did the malarial infection, the parasites of which were driven from the circulating blood by the quinine, cause the rise of temperature, and did this temperature drive the spirilla into the peripheral blood?

There is a clinical point about spirillar fever which I have not seen mentioned in text-books—the facies. This is most characteristic, and I have at the first glance been able to diagnose several cases. The patient has a peculiar ashy complexion, and a quiet, sad, resigned or docile expression, which contrasts strongly with the dull, blear-eyed, "obfuscated," plague patient.

Pneumonia is another febrile disease, which at the onset is frequently difficult of diagnosis. The signs of disease in the lungs are sometimes very late in appearing; a very small patch only

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SEASONAL PREVALENCE OF THE DIFFERENT MALARIA PARASITES.

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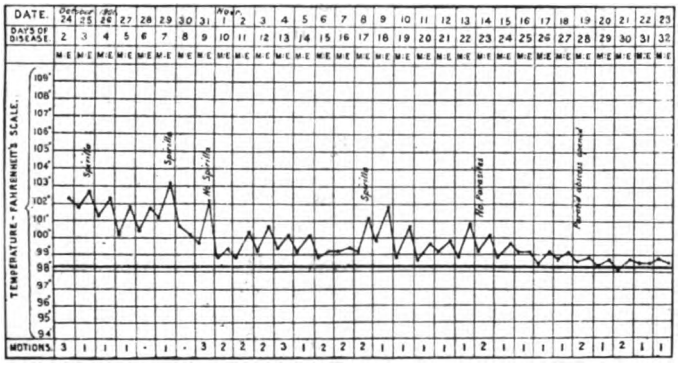
By Mr. Arthur Powell.

No. 1. An almost continued fever.
No. 2. First attack defervescing by lysis.

Nos. 3 to 10 show marked intermission.
Nos. 8 and (?) 10 show no relapse.



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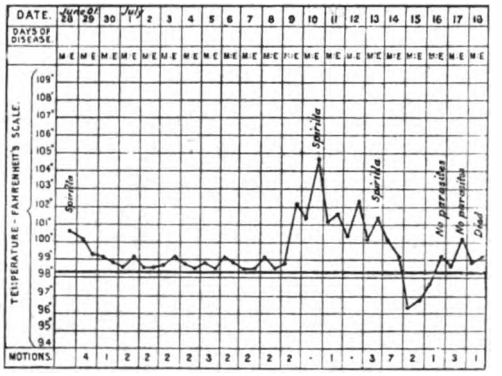

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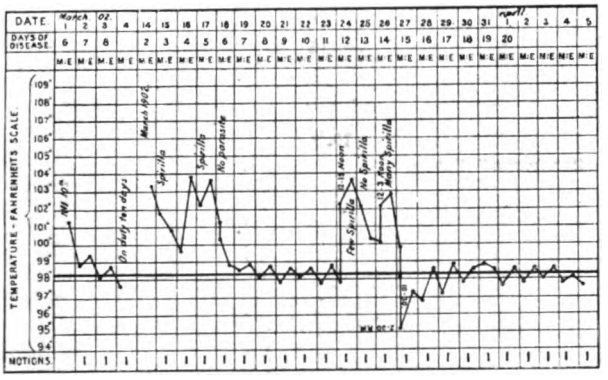

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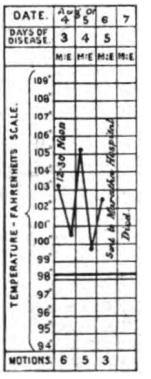

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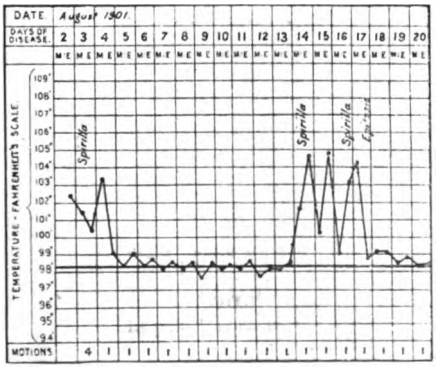

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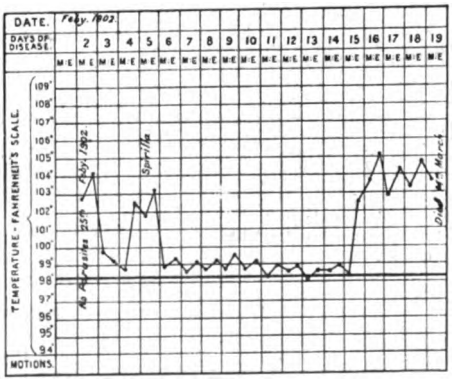
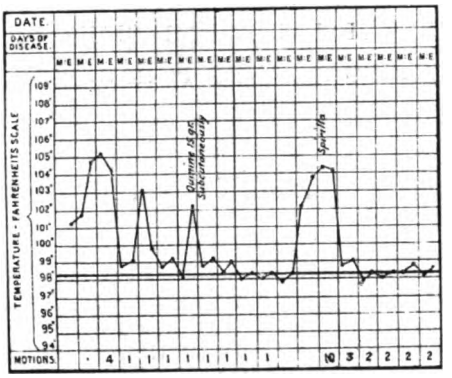


6.

CHARTS SHOWING ABERRANT CASES OF "RELAPSING" FEVER.



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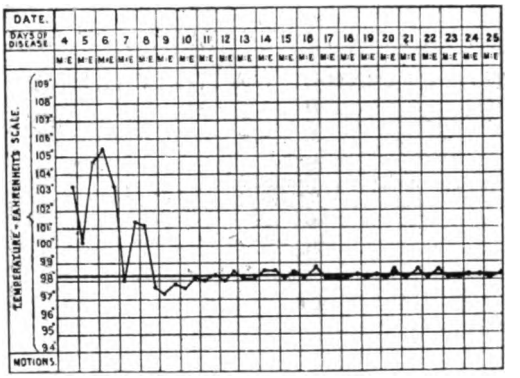

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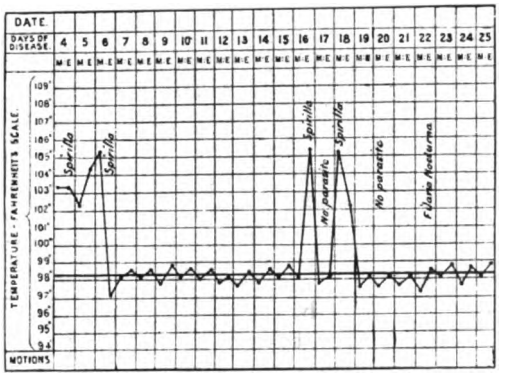

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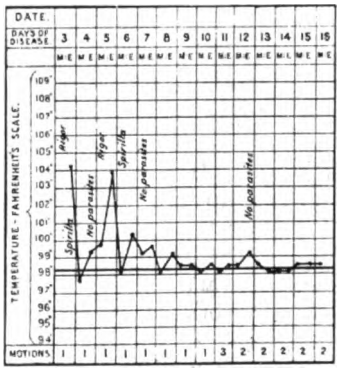

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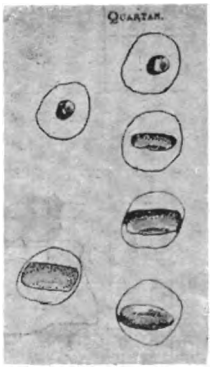
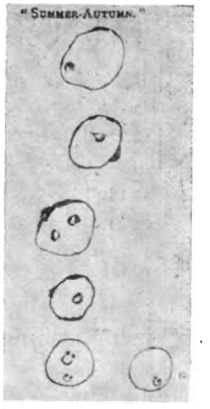
CHARTS SHOWING ABERRANT CASES OF "RELAPSING" FEVER.



Corpuscles, pale green or drab, same as the healthy corpuscles.

Corpuscles either colourless or markedly paler than the healthy corpuscles.



Corpuscles either same colour as those not infected or a deeper green or bluish colour.

(a) "Knocker" shaped rings.

may be affected, and auscultation may give little help.

I hope I am not guilty of pathological heresy when I say I am inclined to believe we have sometimes cases of "pneumonia" infection, when the lungs are not the seat of any special lesion.

In the regions where "sunstroke" is most common, cases of "fulminant pneumonia" are also found. May not some of these cases of "sunstroke" be acute pneumococcus infections?

Of febrile diseases in which I found no parasites, three were followed next day by Herpes Zoster Intercostalis. The fever reached 103°, 102·2° and 101·8°, respectively, in these cases, and only lasted part of a day.

Cases in which the blood examination was negative were subsequently diagnosed in 551 cases, of which there were—

Plague (except 15 mentioned)	102
Pneumonia	92
Tuberculosis	94
Pleurisy, Influenza, Bronchitis	77
Enteric Fever	29
Gonorrhœa, Bubo and other forms of Sepsis ...	78
Syphilitic Fever	6
Lepra	4
Liver Abscess	9

Small-pox, chicken-pox (15); measles, mumps, tonsillitis, etc., make up the balance. I met with one case of scarlet fever in a European child. In 210 cases the diagnosis was reduced to unproved malaria (and undoubtedly the majority were such), febricula or simple continued fever.

I know it is the custom among those whose experience is greater in the laboratory than at the bedside, to sneer at the use of such terms, but terms such as "Colon Infection," though high sounding and in some cases correct, do not cover all. Slight fever, for which no specific cause has been detected by me, is not uncommon in young Europeans, who have been but a short time in the country.

I have failed to find any malarial parasites in many such cases, and to test the theory that these are malaria with a sparse infection. I have withheld all quinine to see if a relapse would occur. No such recurrence has taken place.

Malta fever or anything suggestive of that disease I have never seen in Bombay. A culture of Micrococcus Melitensis obtained from the Research Laboratory, usually gave with any serum a marked sedimentation in dilutions of one in forty or more. I have reason to believe that many of the statements asserting the existence of Malta fever in India, were based on experiments with this strain of coccus. Dr. Gibson informs me that this coccus at first gave negative results with healthy controls, though recently it has undoubtedly become useless. The published cases of Captain Lamb, I.M.S., were carefully confirmed by negative control experiments. Since reading this paper, I have attended a girl of European parentage who has never been outside India. She has had for about three months fever which was diagnosed elsewhere as "Malta fever" on clinical and sedimentation evidence. I find her sputum thickly infected with bacillus tuberculosis.

(*To be continued.*)

ENLARGED PROSTATE.

BY W. J. WANLESS, M.D., *Miraj.*

With special reference to the disease in Indian subjects and the question of choice of operation. With report of six complete Suprapubic Prostatectomies.

THE fact that in India relatively very little seems to have been thus far attempted in the way of radical cure of this most distressing condition is my excuse for offering the following remarks and report of cases at this time.

Total extirpation of enlarged prostate is now being performed with increasing frequency in Europe and America. The operative mortality until recent years has been so high as to frequently deter even the boldest of operators from undertaking the operation. During the past few years, however, by the aid of improved technique and a better understanding of the surgical pathology, the mortality from operation has been so far reduced as to justify the expectation that the attempt to cure by radical surgery this painful and troublesome affection will be undertaken by general surgeons very much more frequently than it is even at the present time.

That enlarged prostate *with complete retention* of urine is a condition quite common in India, I feel sure from the large number of moderately enlarged prostates I have met with in dispensary practice.

With reference to the exciting causes of the disease *as peculiar to India* I am also led to believe from my knowledge of the people in general and from the personal histories I have elicited, that excessive sexual excitement is a causative factor more pronounced in India than in the western countries, for the reason that sexual intercourse is begun earlier and continued later in life than appears to be the case in western countries. Of course it is not becoming one to dogmatize with reference to this particular point, since absolutely positive information is not available to prove or disprove the actual truth of one's observations, so one can only state his impressions which have been derived from a somewhat prolonged and intimate contact with the people in matters domestic and private.

Another exciting cause I believe to be the excessive use of hot curry and spices so common to Indians; the resulting constipation and consequent engorgement of the portal circulation and the production of chronic congestion of the hemorrhoidal vessels affecting the prostatic plexus of veins with which the hemorrhoidals are so intimately related. This is evident from

the relatively large number of cases of hemorrhoids and fistula in ano met with on the plains of India—conditions which are doubtless due in part to the relaxing tropical climate.

Prolonged exposure to the chilling monsoon rains may, I think, be considered a frequent exciting cause. Cases of complete retention of urine in old subjects are brought in from the villages during the monsoon more often than any other season, and very frequently a history of exposure is obtained. On examination the complete retention in these cases is found to accompany enlargement of the prostate, hence this inference.

Lastly, mention should be made of the irritation of the bladder and prostrate resulting from the collection in bladder of highly concentrated urine produced by work and exposure under the hot tropical sun peculiar to a climate like that of India, a well-known factor in the production of phosphatic calculus.

Coming now to the question of surgical intervention in cases of complete retention due to enlargement of the prostate, we have only to think of the helplessness and ignorance of the average Indian cultivator and artisan, frequently located remote from a surgeon, when we are brought to face a greater necessity for radical operation than obtains among the inhabitants of western countries. A catheter life free from cystitis and urethritis for the average man in India, who knows nothing of the first principle of surgical, and in the majority of cases ordinary cleanliness, is necessarily a short-lived one. Even with those who are capable of being instructed in the antiseptic use of a catheter, the period of freedom from infection of the urethra and bladder is in a large percentage of cases only a matter of weeks or months. Given then a prostatic patient of one of the more ignorant classes, who suddenly finds himself unable to urinate and comes to the hospital with a distended bladder, over which it is discovered by a brief period of catheterization and medication that the loss of control is total, three courses are open for consideration in the matter of treatment :—

(1) Indefinite retention in the hospital, or residence close to a hospital or dispensary for the purpose of regular catheterization, an impracticable plan in most cases, for obvious reasons. (2) Discharge of the patient with instructions as to the use of a catheter—a temporary measure at the best and leading sooner or later to infection of the genito-urinary tract. (3) Surgical intervention with the object of permanent cure.—The plan of choice *in every case of the class above referred to, provided of course the general condition of the patient does not positively contra-indicate operation.*

This brings up the question of operation itself. To meet the needs of *this class of patients* in whose behalf I write, an operation which is incomplete and without sure promise of radical cure may at once be regarded as unsuitable. I refer to such procedures as angio-neurectomy, vena section, prostatic and testicular injections with iodine and astringents, suprapubic puncture, prostatic puncture, castration, ligation of vasa deferentia, suprapubic and perineal incision, vasectomy, which have all been tried and found wanting. Vasectomy may occasionally give relief as in case V, but it is uncertain and not always permanent as in the case referred to. Partial removal by knife or cautery is attended with practically the same dangers as complete removal, and the relief obtained is not always permanent. The Bottini operation undoubtedly serves a useful purpose in cases of moderate enlargement, but is scarcely suited to cases of complete retention with intravesical enlargement. We are therefore restricted to some method of total extirpation *in these cases of complete retention* if an operation is to be done at all.

With regard to the choice of route in total extirpation it would seem from the somewhat voluminous reports of operations and methods in current medical literature that the advocates of the perineal operation are gaining converts to their method. In all of the six cases herewith reported I employed the suprapubic intravesical operation known in India as Freyer's method, though probably not performed exactly as Freyer would perform it.

From the recent successful experiences of operators with the perineal method, chiefly in America, and from my own limited experiences of the difficulties of the suprapubic operation, I am inclined to think that this perineal route is destined to become the most popular one of the two. I refer especially to Parker Sym's method, making use of a U or an inverted Y-shaped perineal incision, with a preliminary external urethrotomy in the membranous urethra and the introduction into the bladder of a collapsed rubber bag, which after introduction is distended with water and using the rubber stem as a tractor the prostrate is drawn down into the perineal wound and enucleation thereby greatly facilitated. Murphy, of Chicago, has invented a pair of metal retractors for the same purpose. Lydston, also of the same city, has recently devised a single prostatic retractor, with a semilunar ear hinged on the edge of a staff, and introduced through a perineal incision the same as a bag. The rubber bag seems to possess decided advantages over both these retractors. Dr. H. H. Young, of Baltimore, has recently devised a double-bladed fenestrated prostatic retractor. The fenestrated blades are attached to a double bar stem or handle; the blades are introduced closed through an incision in the membranous urethra and by rotating one bar of the handle upon the other, the blade in the bladder opens, forming a T-shaped tractor. This from the description would appear to be more suitable for India than a rubber bag, and seems to possess decided advantages as a tractor and

in the matter of simplicity and ease of insertion. The advantages of the perineal route seem to be, (1) absence of an abdominal wound and diminished danger of contamination of the peritoneal cavity. (2) Less danger of urinary infiltration and consequent sloughing of the wound. (3) Better natural drainage of the bladder. (4) Better control of hæmorrhage, the pressure of the intravesical bag or tractor serving to close the prostatic sinuses during enucleations, thus greatly reducing hæmorrhage. (5) No intravesical wound, the prostrate and membranous urethra only being opened, and the former not always. (6) Diminished shock from smaller loss of blood. (7) Easier control of post-operative bleeding by packing. (8) No injury to the circular fibres of the neck of the bladder and consequent diminished liability to incontinence. (9) Less danger of sepsis, the wound being pyramidal with its base towards the surface and packed superficially from the bladder. (10) After exposure of the enlarged gland and by use of two incisions through the capsule, one on either side of the median line the integrity of the ejaculatory ducts may be preserved (Young). Syms has recently reported twenty-three consecutive successful prostatectomies by this method, the ages of the patients varying from fifty-four to eighty-seven years.

The absence of the necessary apparatus with which to perform the Sym's operation is my excuse for not having attempted this method in any of my cases. I expect when on furlough shortly to be able to study the perineal method at closer range.

Of the six cases I now report there were five consecutive recoveries and one death, the sixth. As the technique was somewhat modified in the different cases and the convalescence varied considerably, I give the notes of the cases practically as copied from the hospital record.

In all of the cases a median vertical incision of from two to three inches in length was made, a free incision was made in the bladder. In two instances, Cases III and IV, the bladder was divided between ligatures, as the veins in the fundus of the bladder were very large. In all of the cases the bladder was washed with hot boric lotion, or Theirsche's solution injected through a rubber catheter and the catheter tied in, 15 to 20 ounces of solution were used to distend the bladder. The use of the rectal bag to push up the bladder I consider useless and even dangerous. On one occasion when using the bag in a suprapubic cystotomy for another purpose, the bag pushed the distended bladder to one side, replacing the bladder, but was fortunately recognized before an incision was made through the rectal wall instead of the bladder. In these cases the bladder is usually capable of large distension from previous retention. In all of the operations an assistant with his finger in the rectum aided by pushing up the base of the bladder.

The points of interest I would observe are:—(1) I found the density of the glands, and the consequent effort necessary to enucleate them to vary a good deal even from that of great ease to that of greater difficulty. Case VI was exceedingly difficult to enucleate. The capsule was intimately adherent to the covering sheath, and the gland itself contained very little of the soft glandular structure found in the other cases. It was with the greatest difficulty that the capsule was separated from its sheath. In all of the cases the finger of an assistant inserted into the rectum served to push the gland towards the bladder.

(2) The question of the control of hæmorrhage is an important one. In all of the cases excepting Case I packing of the empty prostate space was used to control the hæmorrhage. In the first case the bleeding was almost completely controlled by the use of hot sponges and hot boric lotion. In the others in spite of hot sponges and the free use of hot boric lotion the bleeding continued, and I felt it unsafe to close the bladder without the additional precaution against continued hæmorrhage of packing. In the last three cases three provisional stitches of catgut were placed in the bladder wall at the point of the wound, from which three gauze strips were brought out; these sutures were tied the day following the operation, after the gauze was removed. This served to close the bladder wound and to keep it tight, thus preventing escape of urine in the circumjacent tissues of the external wound.

I think in another case, instead of packing, I would give the patient a preliminary course of calcium chloride, swab the prostrate cavity with adrenalin chloride after enucleating the gland, and keep the patient on suprarenal extract or adrenalin internally for twelve to twenty-four hours after operation. Complete checking of the bleeding is a very important matter in the prevention of shock in these old and weakened patients.

(3) Stitching a part of the wound to the skin was done in Cases II and III with the object of securing prolonged drainage of the bladder; the method prolongs healing, but helps to prevent escape of urine into the prevesical tissues. I think the better plan is to close the bladder wound in two or three layers of Lembert sutures of fine silk, avoiding mucosa in the stitch, and, by inverting the wall of the bladder, build it up around the tube using Lembert stitches, or by use of a purse string suture, if the bladder wall is redundant, after the manner of Senn's Gastrostomy. Drainage seems indispensable in these cases in view of the usually accompanying cystitis. If it were possible to dispense with drainage from above and completely close the bladder thereby securing primary healing it would be a great gain. The making of a perineal wound to accomplish this however seems to me unjusti-

fiable on account of the shock of an additional wound. The complete closure of the bladder wound without the use of a drainage tube I regard as more likely to lead to sloughing of the prevesical tissues in these cases than when a tube is used. These bladders are usually infected, and a certain amount of contamination of the external wound is inevitable in most cases, hence the necessity of drainage and a partly open wound. Once sloughing begins in these old patients the healing process is apt to be both tardy and treacherous. These weak points in the suprapubic operation appear to commend the perineal route by which many of them are likely to be obviated.

(4) The temporary effect of vasectomy as in Case V is to be noted. It gave relief for a year. In this case the enlargement was of the "glandular" variety, the cases which are said to be relieved by vasectomy. The gland was entirely as large, if not larger, than it was when the patient came to the hospital the first time a year previously.

(5) The complication of an obstinate diarrhœa occurring in Case III is to be carefully guarded against and promptly treated. The diarrhœa appears to be due to the absorption of urine through the wound in the perineal tissues. I recall having had a patient die as the result of the exhaustion from diarrhœa which baffled every attempt to check it. The case was one in which a suprapubic cystotomy had been done for stone, and there was considerable sloughing of the wound from escape of urine in the raw tissues. Granulation tissue forms slowly in these old subjects, and it takes a considerable time before absorption of urine into an open wound is checked; hence the desirability of securing complete drainage of the bladder.

(6) The diagnosis in all the cases was positively made by the history, symptoms and examination per rectum, and by the use of a stone searcher. A cystoscope was not available, and therefore was not used. The distance on the catheter at which urine begins to flow gives a fair idea of the amount of intravesical projection of the enlarged prostate. In Case III the flow began at twelve inches. The ordinary metal or gum elastic catheter failed to completely empty his bladder. This accounts for the fact that he experienced only partial relief when catheterized in another hospital where a catheter of ordinary length was used. An unusually long catheter with a large curve was necessary to satisfactorily catheterize and wash out his bladder.

(7) An important point in the after-treatment is the getting of these old patients into a sitting posture as soon as possible after the operation.

(To be continued.)

THE CHOLERA EPIDEMIC IN PURI TOWN AND DISTRICT IN JULY, 1902, AND ITS SPREAD THROUGHOUT LOWER BENGAL.

BY S. ANDERSON, M.B., B.SC.,
CAPTAIN, I.M.S.

WHILST acting as Deputy Sanitary Commissioner, Eastern Bengal Circle, I was deputed to proceed to Puri to supervise the arrangements made for the Rath Jatra festival and suggest other precautions necessary to prevent the spread of cholera.

In Puri town and district and throughout Orissa, cholera shows itself year after year regularly over a defined area, and from this "infected focus" the disease invades the same bazaars and villages, leaving the greater part of the district untouched.

The usual course of the disease is intimately connected with the pilgrimages.

In Orissa, cholera is more or less endemic from January to August, during which period there are four pilgrimages, *viz.*, in March the Dol-Jatra, in April the Baisack, in June the Snan-Jatra, and in July the most important of all, the Rath-Jatra.

Previous to the opening of the railway to Puri, cholera abounded along the pilgrim route, especially on the Cuttack-Puri road and adjoining country; the outbreaks were always worst at the period when the pilgrims were passing in the greatest numbers to and from the shrine of Juggernath.

Since the opening of the railway on the 1st February, 1897, it is computed that only about one-tenth of the pilgrims now travel by road; and as the remainder travel by rail, the danger of epidemic cholera being widely disseminated over India from its home in Orissa during the time the pilgrims are returning from the Puri fairs has enormously increased.

The Sanitary Commissioner's Return of the relative intensity of cholera in each district shows that Puri cholera frequently becomes epidemic, and that when the mortality there is high it is also high in Cuttack, Balasore and Howrah, all traced to importation by pilgrims from Puri.

In 1901 the Puri district was placed first with the high death-rate of 9·20 per 1,000 of population, an increase of 5·44 as compared with the average of the previous ten years.

In 1902 isolated cases occurred for weeks previous to the great festival, both in Puri town and district, but some pilgrims were attacked on the way from their homes to the railway station, others on the railway, and from the 2nd to the 7th July in all some 12 cases were removed from the train, most of them in a moribund condition.

This indicates one of the ways in which the disease becomes disseminated, as not only are

the occupants in the same compartment more liable to become infected, but they also infect pools and tanks at stations along the line.

Having to wait for three hours at a junction on the line, I noticed many of the pilgrims washing loin cloths and other garments in the pools close by the railway line; these pools could not fail to become infected, and, as many of the pilgrims cleansed their mouths and drank this water, they would assuredly be victims to cholera.

The number of people present in the town on the 6th and 7th July, the first two days of the festival, was as follows:—

Number by rail to Puri	49,987
Number by rail to Sakhigopal	2,861
Local people from Puri, Cuttack and Balasore Districts	20,000
Total ...	72,848

And if to this number be added the permanent population of Puri town, *viz.*, 30,857, then over a lakh of people were present.

From the 1st to the 20th July there were 306 cases admitted to the Cholera Hospital from an average population of 50,000 or ·6 per cent.; the mortality was 254 or 83 per cent.—a high percentage indicating the degree of virulence of the disease.

Dr. H. Sen, in an article in the *Indian Medical Gazette* for April, 1903, has given a comprehensive statement showing the mortality from cholera for each month in the years from 1890 to 1901.

In the same paper there is given a diagram showing the incidence of cholera mortality in the district of Puri based on the averages of the twelve years from 1890 to 1901; from this it would appear that the disease reaches its acme of mortality almost yearly in the month of July.

It is unnecessary to reiterate here the conditions under which cholera flourishes in Puri town and district; suffice it to say, that these have been thoroughly gone into the aforementioned paper together with the measures then taken to alleviate them.

The main object of this paper is to indicate how the epidemic of cholera in July, 1902, spread throughout Lower Bengal.

What might be termed "primary dissemination" takes place in Puri town, and more especially at the railway station, where pilgrims have to wait sometimes a day or even two days before they are allowed on to the station platform.

From July 3rd to July 20th 44 patients were admitted to the Puri Railway Hospital, of which 32 died, and of the whole number, 37 cases alone were removed from the station yard.

Then there is what might be termed "secondary dissemination," which occurs on the Juggernath Road to Cuttack, and on the railway line to Calcutta, and from thence to the mofussil.

In the epidemic of 1901 Dr. Sen states "that polluted sources of drinking water were at the root of the spread of the disease, and could be easily traced," and he gives an instance.

The intensity of the spread of disease depends to a great extent upon the degree to which the water of villages and towns *en route* is polluted by the infected amongst the returning pilgrims.

Where the water-supply of such towns and villages is abundant, little cholera will prevail, as was fortunately the case in 1902; on the other hand, where the village tanks and water-supplies are low and scanty, as occurred in 1901, then pollution takes place easily and cholera abounds. There is thus a distinct relation between the rainfall and the intensity of the spread of the disease, and there is little doubt that in the year 1902 the spread of the disease was influenced thereby. In 1901, the rainfall was small and cholera spread rapidly; in 1902, the rainfall exceeded the average, and so the amount of the disease was comparatively less.

A circular letter was written to Civil Surgeons of districts from which the pilgrims came, requesting information as to the number of cases of cholera occurring in their respective districts during the period from 5th July to the 2nd August, 1902. These returns give but a rough indication of the number of cases caused by pilgrims arriving from Puri, as mainly those who came to the Civil Hospitals for treatment are noted, not counting many who probably died in their homes beyond the cognisance of the Civil Surgeons or Registrars. Some cases of true cholera would be returned as "Acute Diarrhœa," and so would not be shewn in this return.

Statement showing the distribution of cholera throughout Bengal from 5th July to 2nd August, 1902.

Name of District.	Total number of cases of Cholera.	Number of cases actually traced to Puri pilgrims.
Puri	349	286
Cuttack	14	7
Balasore	20	10
Howrah	14	14
City of Calcutta ...	160	40
24-Pergannahs ..	6	*Nil*
Hooghly	1	1
Khulna	4	*Nil*
Nadia	2	2
Midnapore	27	9
Murshidabad .	6	*Nil*
Gaya	78	3
Faridpur	15	2
Backergunge ...	32	3
Tippera	13	6
Monghyr	11	*Nil*
Noakhali	2	1
Total ...	754	384
Bengal-Nagpur Railway Company ...	163	163
Eastern Bengal State Railway ...	5	5
Total ...	168	168
GRAND TOTAL ...	922	552

The insanitary condition of the villages in Puri district has been admirably depicted by Dr. Sen, and he has described how cholera is disseminated amongst the villagers; he also details a scheme to prevent the inroad of cholera into villages.

It is an almost universal experience that a cholera epidemic runs its own course; but the prevention of the disease in Puri town itself, the focus of "primary dissemination," is quite within the domain of practical sanitation.

Previous to the advent of the majority of the pilgrims, the lodging-houses were inspected and their accommodation certified, private camping grounds and street camping were disallowed, all public and lodging-house wells were permanganated, extra staff for conservancy work was entertained, and all lodging-house keepers were warned to notify the police or health officer on the occurrence of a case of cholera, so that disinfection measures might be carried out, and the patient isolated.

Arrangements were made for the cremation of the bodies of persons dying from cholera, for the cleaning of the steps and banks of tanks, for the prevention of promiscuous defecation near tanks, wells, &c., and for the washing of clothes in, or drinking or carrying away water from, the tanks. Most of these measures were in the main well carried out, except those referring to the washing of clothes in tanks and the drinking of and carrying away of water from tanks, which measures were almost impossible to properly carry out.

The chief sources of infection in Puri town are the sacred tanks; at all the local festivals or *melas* the pilgrims largely resort to the Narendra and Markanda tanks, less so to the Indradyumna, whilst the Swetaganga, which is the smallest and is considered specially holy, is in a deplorably insanitary state and consists mainly of the washings and liquid sewage from the latrines in close proximity all round the tank.

I have frequently witnessed large numbers of people bathing in these tanks, and as the clothes of infected people were continually being washed in them, the water continues to be polluted and never gets a chance of purifying itself.

It will be understood to what extent these tanks are infected, especially the Narendra, when I mention the fact that many pilgrims came and lay down on the banks to die, much of whose dejecta was washed into the tanks and some actually washed themselves in the tank whilst suffering from the disease; these cases always occurred during the night.

Though all the wells were permanganated, yet many of them are certain to have become infected with choleraic discharges. This is specially the case with some of the private and lodging house wells, which are all shallow surface soil wells, and, as they have no pucca alignment and no protecting wall, they must be easily contaminated either from actual surface washings or from percolation through the surface soil. I have myself observed people washing themselves and their clothes close to the unprotected mouth of a well situated in the compound of a lodging-house in which cholera had occurred.

Another source of infection is the private latrines, very few of which have receptacles, and the ground thus becomes saturated with filth before its removal. Some of these latrines are in close proximity to the wells, and thus percolation easily takes place.

Pools and tanks on the roadside, more especially on the Juggernath road from Puri to Cuttack, are a fruitful source of cholera. Pilgrims becoming affected with cholera invariably go to the nearest pool and lie down close to the water's edge; the result is that these people contaminate the water, and this being drunk by passers-by further disseminates the disease.

Some of the cases in the Cholera Hospital have been traced to the eating of the sacred food "Mahaprasad," but being the only food allowed them during their stay in the town, it is consumed despite its state of putrefaction and thus disseminates the disease.

If the conditions under which the pilgrim exist be remembered, the unavoidable overcrowding, deficient ventilation, the impure water, the bad food and the general insanitary condition of the place, all these tend towards diminishing the resistance of the individual and increasing his susceptibility to cholera.

To ameliorate these conditions and, if possible, prevent further outbreaks in places similar to Puri, where there are large gatherings of people, it seems to me, that in addition to the above, the following precautions are necessary:—

1st.—The provision of a permanent camping ground, where the pilgrims would be housed in large corrugated iron sheds; the ground should be a good distance off from the town.

Such a camp should be furnished with the latest sanitary arrangements; sufficient latrine accommodation should be provided, and the water-supply obtained from deep wells, the water being pumped up to a cistern and from thence supplied by means of pipes on the tap system; in this manner the water-supply would be safe-guarded from contamination.

A pucka masonry dhobi-ghat should be provided for the washing of clothes, and the ground itself should be thoroughly drained.

2nd.—The sanitation of the town must, especially during the rainy season, be as good as possible; the scavenging, the flushing of drains, the removal of sewage and refuse, and above all, the removal and disposal of excreta to a good high trenching-ground.

3rd.—That in view of the fact that the sacred tanks never get a chance to purify themselves, the temple authorities be asked to proclaim that one of the tanks is sacred for a week at a time. During that period the people would be allowed to bathe in that tank, but only sprinkle water on their heads from the other three.

No one even dares to bathe in the Swetaganga, but each one of the other three tanks would then have a rest of two weeks in every three, and the action of the sun and air would considerably reduce the number of cholera germs and allow the bacteria in the water time to change the harmful organic matter present into harmless inorganic.

4th.—That it be impressed upon the temple authorities the importance of supplying good "Mahaprasad;" the water used in boiling the rice should be beyond suspicion.

5th.—The immediate notification of a case of cholera to the Health Officer, so that measures for disinfection of the place and removal of the patient to the cholera hospital may be effected.

At the Cholera Hospital patients were placed on straw mattresses, which could afterwards be burnt; every precaution to prevent dissemination was rigidly carried out, vomited matter and stools were destroyed in an incinerator, hospital blankets, &c., were regularly steeped in perchloride and boiled, and the floors were frequently washed with lime-water, whilst the clothing of patients on discharge was burnt and new clothing given them.

During the first stage and previous to collapse setting in, patients are ordered the following mixture:—

℞

Acidi Sulphurici dil.	...	m. 20
Chlorodyne	...	m. 20
Tinct. Capsici	...	m. 5
Aquam Menth. Pip. ad		℥j
		M.

Sig.

One dose every two hours.

During collapse, heat is supplied by means of warm blankets, and hot bottles are applied to the feet, thighs and sides of the chest; an injection of ether and strychnine is given when required, and the following mixture ordered:—

℞

Tinct. Nucis Vomicæ	...	m. 5
Spiritus Etheris Sulphurici	...	m. 20
Rum	...	℥ij
Aquam Chloroformi ad	..	℥j
		M.

Sig.

One dose every two hours.

During the stage of reaction, the following mixture is given:—

℞

Tinct. Digitalis	...	m. 5
Spiritus Etheris Nitrosi	..	m. 10
Tinct. Capsici	..	m. 5
Inf. Chiratæ ad	...	℥j
		M.

Sig.

One dose every four hours.

In convalescence, patients are again ordered the sulphuric acid mixture and a powder containing lead acetate, opium and grey powder, which gives a good result. Light nutritious food, such as milk, sago and arrowroot, is given frequently in small quantities, whilst barley water is given to the patients when thirsty at any time during the attack.

SYMBLEPHARON AND ITS TREATMENT: TWO CASES TREATED SUCCESSFULLY BY TRANSPLANTATION OF FLAPS OF MUCOUS MEMBRANE FROM THE MOUTH.

By HARRY GIDNEY, F.R.C.S. (Edin.). D.P.H. (Camb.),
Captain, I.M.S.

Symblepharon, as is well known, is a disease which consists of a pathological adherence of one or both eyelids either partial or complete to the eye-ball. The cornea may or may not participate in this adhesion but it usually is somewhat implicated, and this adhesion, between the eyelid and cornea, is called by some "*Traumatic Pterygium.*" When, besides this condition of affairs, the two eyelids adhere to each other it is called anklyoblepharon.

This disease is usually the result of some very strong irritant, or caustic, gaining access to the eye, and is generally accidentally produced, such as by molten lead, caustic alkalis, strong mineral acids, lime, boiling water, etc. It may also result from a severe burn of the eye, or the careless and injudicious use of very strong astringent applications as nitrate of silver, &c. Diffuse ulceration and consequent sloughing of the internal aspect of the eyelid may be the exciting cause, or a trauma to the eye which produces a complete denudation of the conjunctiva of the part.

The amount of destruction of the conjunctiva, in this disease depends on three factors chiefly, *viz.* (*a*) the strength of the irritant or trauma for the stronger the irritant the more fatal and complete the destruction; and (*b*) the length of time the irritant has had to act on the parts. Even very powerful irritants and caustics if removed at once from the eye produce very little destruction, and that only of a superficial nature. And (*c*) the extent or area of the conjunctiva that has been acted on by the irritant.

Before adhesion can take place between the eyelid and eyeball at any part, there must be total and complete destruction and disappearance of the conjunctiva of the part. The process is generally as follows:—The ocular and palpebral conjunctivæ being destroyed or burnt (where the action is slight and superficial the epithelium is thrown off, and regeneration takes place), a slough forms which in time separates and granulations spring up from the opposing raw surfaces. These unite and in the course of time develop into fibro-cicatrical tissue which produces a firm attachment of the lid to the eyeball. The train of events is similar to that which occurs in healing by second intention of any other wound of the body.

Should the adhesions be confined to only a small area it results in the development of a band or bands, narrow or broad, stretching from the lid to the eyeball.

When the cornea is included in the adhesions, the dangers are increased and the prognosis less

favourable, being dependent entirely on the depth and extent of the corneal lesion and its situation. Should the lower quadrant be the part affected, as it usually is, and the resulting opacity be outside the area of the pupil, then the visual acuity need not necessarily be lessened or in any way affected. But should a large area of the cornea be affected, then vision is seriously lessened, requiring a subsequent iridectomy to be performed.

Symblepharon should not be mistaken for a shortening of the conjunctival sac, which is found in Xerophthalmos, in which disease there is an extensive cicatricial degeneration of the conjunctiva, which assumes a dry lustreless condition associated with shrinking of the membrane and is most commonly the result of an attack of pemphigus or granular ophthalmia.

This condition of affairs is often wrongly named symblepharon.

I have seen a good number of cases of symblepharon and think the following classification accordingly to the severity of the case answers all purposes, *viz.* (1) mild; (2) medium, and (3) severe.

(1) *Mild.*—In this class I include all those cases where a band or bands stretch from the eyelid to the eyeball, and there is a fairly free movement of the eyelid.

(2) *Medium.*—In this division are included all those cases in which there is a firm adhesion between only a part of the eyelid and the eyeball.

(3) *Severe.*—When the whole of one eyelid or both eyelids are firmly adherent to the eyeball, and there is absolutely no movement in the lid. This I call a complete symblepharon.

The visual results obtained after relieving the adhesions in any of the above three classes depend entirely on the extent and localization of the corneal lesion. In very mild cases a band of adhesions may extend from the inner surface of the eyelid to the centre of the cornea, and here vision would be seriously impaired; again, the case may belong to class (3) (severe) and yet vision be perfectly normal, for I have seen a case where the whole of the lower lid was firmly adherent to the eyeball beneath the level of the cornea; the eyelid seemed to have sunk down and become attached to the eyeball, the cornea being quite clear and normal. In those severe cases in class (3) where both the lids are adherent, and more especially when anklyoblepharon exists and the exciting cause must have been a very severe one, the cornea is usually entirely destroyed and vision is absolutely *nil*. The inability to move the eyeball caused by these firm adhesions is a constant source of trouble and irritation to the patient, and frequent attacks of conjunctivitis are set up, which aggravate the trouble, often producing a considerable amount of corneal haziness. When a burn is the cause of the symblepharon there is generally a certain amount of ectropion and displacement of the punctum lachymalis, or a closure of the orifice causing epiphora.

Treatment.—If the symblepharon seriously affects the normal movements of the eye-ball, or if it is the means of producing serious disturbance of vision by overlapping the cornea, or if it is the cause of frequent recurring attacks of conjunctivitis, it is desirable to relieve it by means of an operation. Operative procedures should not be undertaken till there is a total subsidence of all inflammation and the cicatrices have consolidated thoroughly. All attempts to prevent union of the eyelid to the eye-ball by means of loosening the adhesions, cutting through them or the interposition of metal shields are useless and only a sheer waste of valuable time. The operative measures resorted to differ according to the nature and severity of the case.

In Class 1 (*Mild*).—Where simply a band or bands stretch across from eyelid to eye-ball, it may be severed by means of a ligature; if the band be a broad one, two ligatures may be used, one for either half of the band. When there are several bands, each must be attacked in this way.

In Class 2 (*Medium*).—Where a part of the eyelid is adherent to the eye-ball, the procedure is quite different. In a few words the object of the operation is to separate the eyelid from the eye-ball by cutting through the adhesions and covering both the exposed surfaces, *viz.*, palpebral and ocular with a layer of conjunctiva taken from the healthy conjunctiva on either side of the cornea, as advocated by Teale, or with a layer of mucous membrane taken from the lips, mouth, or vagina as recommended by Riverdin and Stellwag, or a transplantation of a portion of a rabbit's conjunctiva as advised by Wolfe. Teale has also suggested the use of a bridge-like flap of conjunctiva, which he obtains from above the cornea, bringing it over the cornea and using this to cover the raw exposed surface, the base of the flap being cut after the flap is sutured into its new position. It really does not matter much from where you obtain your epithelial flaps so long as you get a sufficient amount. I have tried Teale's operation in one or two cases, but the results were not very satisfactory, in fact I could not obtain sufficiently large enough conjunctival flaps without producing an undue amount of tension and consequent shrinking, and, moveover, the eye could not spare much of its conjunctiva.

In my two last cases which I allude to in this paper, I did a modified Stellwag's operation, obtaining my mucous flaps from the mouth, as follows:—

Case I.—The whole of the inner two-thirds of the lower eyelid was adherent to the eye-ball; there was also a small corneal adhesion. The patient was a Staffordshire policeman, and the cause was an accidental introduction of some strong caustic alkali which he merely washed

out and did not trouble about till the disease had far advanced, I saw him 5½ months after the accident with the affected part of the eyelid firmly adherent to the eye-ball. He was placed under chloroform, and by means of a blue pencil the hidden and adherent part of the corneal circle was mapped out on the skin of the eyelid

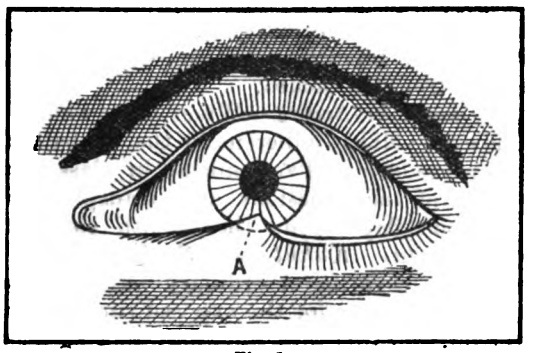


Fig. 1.

A.—This was the part adherent to the cornea. The dotted lines were the guide for my incision, indicating the contour of the corneal circle.

as a guide for my incision, *vide* Fig. 1, A. I then cut down right through the whole thickness of the lid, leaving this small triangular piece of eyelid adherent to the cornea. The lid was then dissected off the eye-ball (*i.e.*, the adherent part of it) right down to the inferior conjunctival fornix, taking great care to get this sulcus on a level with the healthy part of the fornix of the outer third of the eyelid. This was a very bloody procedure at first, but the free use of adrenalin solution (chloride, 1 in 1000) rendered the rest of the operation almost bloodless.

I roughly measured the size of the surfaces requiring epithelial coverings and then proceeded to cut out the mucous membrane required from the mouth and lips. I obtained three

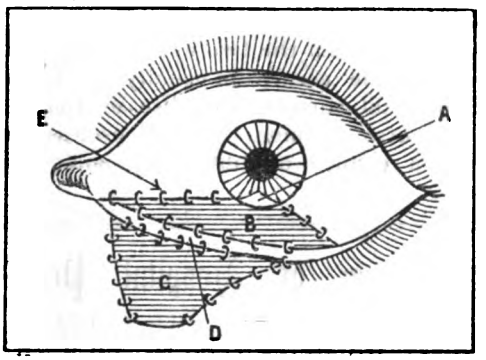


Fig. 2.

A.—Triangular piece of symblepharon adherent to cornea.
B.—Exposed ocular surface covered over by mucous flap B.
C.—Everted (previously) adherent part of eyelid covered over by mucous flap C.
D.—Conjunctival fornix (inferior) covered over by long narrow mucous flap D.
E.—Fine interrupted sutures.

pieces of mucous membrane, two of these for the ocular and palpebral exposed surfaces and a third a somewhat narrower and longer piece for the fornix. All these pieces were somewhat larger than the raw surfaces as I wanted to have more than enough so as to compensate against the subsequent shrinking which usually occurs.

These three flaps were then placed in their respective positions and kept fixed there by means of a liberal application of very fine sutures. A glance at Fig. 2, *B*, *C* and *D*, will show the position of these flaps; here I have purposely everted the previously adherent part of the lower lid so as to explain myself diagramatically; *B* being the flap over the exposed raw (previously adherent) ocular surface; *C* the previously adherent but now free lower lid (everted); and *D* the conjunctinal fornix where I have placed my long narrow flap of mucous membrane. The light triangular piece in the lower corneal quadrant is the part of the adherent eyelid, or symblepharon, which has been left attached to the cornea. This in the course of a short time soon atrophied and disappeared, leaving a slight corneal opacity behind, which did not interfere with vision. These flaps healed very rapidly and firmly, and the result was all that could be expected. The third day after the operation, and on subsequent days, when I dressed the eye, I gently passed a fine probe between the eyelid and eye-ball so as to tear down any slight adhesions which might have developed. I consider this as a very *important* point in the after-treatment of these cases, as it prevents the formation of any subsequent adhesions which are likely to develop from small uncovered areas. I saw this man regularly every month for almost six months after the operation, and up to that time there were no signs of any tendency to a reunion of the surfaces, his lower eyelid being freely moveable.

The second case was almost similar to the first, but slightly more advanced, encroaching somewhat on the pupillary area of the cornea and producing a fair amount of visual disturbance.

I treated this case (which was that of a Hindu signboard painter) in precisely the same way as Case I, with the same result. Except, as I said before, the corneal opacity interfered with his vision. I intended doing an iridectomy afterwards, but he left the place.

In the performance of this delicate operation there are some important points which the surgeon has to pay great attention to, as on them depends success or failure, *viz.*:—

(*a*) All bleeding must be arrested entirely at the surfaces where the transplantation is to take place, and I again assert that the application of adrenalin chloride solution (1 in 1,000) is invaluable during this part of the operation, for it renders an otherwise rather bloody operation comparatively bloodless; this helps the surgeon tremendously, for he can see plainly what he is doing the whole time, and moreover obviates the constant application of swabs to the bleeding surface, which undoubtedly cause some irritation to the cornea and adjacent conjunctiva.

(*b*) Knowing that mucous flaps usually shrink to almost two-thirds of their original size, one should be very careful that the original flaps are large enough. It is safer and wiser to err on the safe side and have your flaps too large, rather than an exact size of the exposed surfaces or smaller, for should your flaps be not large enough and shrinking occurs, small areas are left unprotected with epithelial covering, and a reunion is the inevitable result.

(*c*) The flaps should consist of mucous membrane *only*, and no submucous tissue at all.

(*d*) The operation should be performed as speedily as possible, so as to have mucous flaps with full vitality in them, and so as not to keep them immersed for too long a time when their vitality is bound to suffer. A good deal of the surgeon's time is here taken up in arresting, by means of a swab or sponge, the capillary oozing from the exposed surfaces, and again I strongly advocate the use of adrenalin chloride as a rapid and most powerful local styptic.

(*e*) There should be no tension of the flaps as they occupy their new positions, and this is obtained by having large enough flaps.

(*f*) There should be a liberal application of fine delicate sutures to help and keep the flaps in their correct positions.

(*g*) Great attention should be paid to the fornix. One is apt to neglect this sulcus, but I believe it in a measure decides the result of the operation, for if it be not properly and adequately covered, adhesions are bound to take place, resulting in a certain amount of fixity of the root of the eyelid and constant discomfort to the patient and most probably a subsequent entropion with its attendant disasters.

(*h*) The flaps during the interval between their detachment and adjustment (which should be as short as possible) should be kept moist and warm. The application of the long narrow piece of mucous membrane for the fornix is rather difficult and tedious, requiring a deal of patience, but the after-results amply compensate the surgeon for this little extra trouble.

I am of opinion that three flaps of mucous membrane properly applied and ligatured into position, *viz.*, one for the ocular surface, one for the palpebral surface, and the third one to fill up the sulcus of the fornix answers all purposes and gives better results. It is this little toilette of the operation that I attribute the success of my cases with absolutely free movement of the lid.

In cases where there is a very small surface to cover with conjunctiva one can easily do as Teale advocates, *viz.*, obtain it from the conjunctiva of the eye from either side of the cornea, or as a bridge-like flap from above the cornea; but even here we often meet with cases in which the non-adherent or non-diseased parts of the ocular conjunctiva are inflamed, hypervascular, discolored or somewhat contracted, and these eyes can ill spare any conjunctiva. One can more readily and easily obtain liberal flaps from such a large mucous surface as the mouth than from an already partly diseased eye, which cannot afford to spare any of its mucous covering.

In this article I do not mean to put this operation as a new one before the profession, but, as a modification of that of Stellwag and of Riverdin, the latter consists in covering the exposed surfaces with small pieces of mucous membrane obtained from the mouth.

In Class (3) *Severe.*—When the whole of the lower eyelid is adherent to the eyeball, the same procedure as I recommend in class 2, *viz.* division of the adhesions and transplantation of mucous flaps from the mouth should be tried. *Harlan*, *Kuhut* and *Snellen*, however, advocate a covering of ordinary skin and not mucous membrane for the exposed surface of the lower lid, and this they obtain by making a skin flap from the skin below the lower margin of the orbit, and turning it up as on a hinge and slipping it through another long incision made above this flap on a level with the lower orbital margin, and which incision, being made right through the entire lid, acts as a button-hole for the skin flap to be passed through. This skin flap is next sutured to the inner surface of the lower eyelid. This skin, after some time, becomes modified and somewhat resembles mucous tissue, but does not act in the same way, as the hairs which develop are bound to irritate the conjunctiva and cornea and set up irritation.

When both lids are adherent they may each in turn be separated and covered over with flaps of mucous membrane either from the mouth or from a rabbit. When anklyoblepharon is present, and this, being generally the result of a burn, is almost always accompanied by symblepharon, it can be remedied by a division of the adhesions between the two eyelids, but in these severe cases the cornea is usually so destroyed by the original cause of the disease that operative measures are more or less useless unless there is a chance of obtaining some visual results.

A Mirror of Hospital Practice.

A NOTE ON STIFFNESS OF THE ARM AFTER AMPUTATION OF THE BREAST, AND A GOOD WAY OF AVOIDING IT.

By F. P. MAYNARD, M.B., F.R.C.S.,

MAJOR, I.M.S.,

Civil Surgeon of Darjeeling.

Every surgeon is unpleasantly familiar with the stiff and frequently œdematous arm only too often left after an amputation of the breast, the operation having in every other respect been a

complete success. This stiffness is partly due to the confinement of the limb in one position leading to adhesions in the shoulder joint, but is no doubt largely due to the axillary portion of the wound healing while the arm is by the side. The scar tissue then formed has to be stretched, as well as the adhesions in the joint broken down, before movement is restored. Experience shows that this state of affairs is largely due to the usual practice of applying the dressings with the arm fixed to the side. Œdema depends oftener upon thrombosis, but even œdema is probably often due to the mode of dressing. When on furlough in 1900 I found Mr. Butlin and some other surgeons applying dressings to their cases of amputation of the breast with the arm placed in an extended position. The arm is kept drawn up above the head like it is while the axilla is being cleared out, and when in bed the wrist is tied loosely with some soft material to the head of the bed. In this position the wound forms one straight line, and is shallow compared with the deep and bent wound resulting from bringing the arm down. Moreover, the dressing can be applied much more easily and even pressure applied better so as to render healing quicker and drainage less necessary. The wound remains cooler and contrasts favourably with that found in an axilla hot and sweating as it usually is. The chief advantage, however, of this method lies in the greater and earlier mobility resulting. Almost as soon as the wound is healed the arm can be used quite freely and no stiffness remains. I have practised it for over three years now, and in all cases with excellent results. In two of the cases the patients, after amputation of the breast with clearing out of the axilla and of course exposure of the axillary veins, left hospital on the 8th and 10th days with wounds soundly healed, and they were able to do their hair and use their arms with complete freedom. My reasons for publishing this note are that I am sure no one who has once tried putting up his cases in this way will ever go back to the old method, and that up till recently I have hardly met a surgeon who had heard of it and not one who practised it. It only requires to be known and tried to be adopted.

ESTIMATING THE SPECIFIC GRAVITY OF URINE.

BY S. MALLANAH, M.D., D.P.H. (CAMB.).

Lecturer, Hyderabad Medical School, Chaderghat.

IF the quantity of urine is too small to float an urinometer, it is generally diluted with one, two, three, four, six or more volumes of water as required and the specific gravity taken in the usual way. The actual specific gravity of undiluted urine is obtained by multiplying the last two figures of the specific gravity of diluted urine by the number which represents dilution. This rule, which is given in text-books, no doubt answers very well when equal parts of urine and water are taken, but it does not hold good for other dilutions. In such cases it is necessary to multiply the last two figures of the specific gravity of diluted urine by the number which represents dilution, and then add the number representing dilution to the product obtained. For example, if one part of urine be diluted with three parts of water and the specific gravity of diluted urine be 1004, then the specific gravity of undiluted urine will be 1020 as shown

$$(04 \times 4) + 4 = 20$$

According to the old method the specific gravity in this case would come to 1016, which is less approximate than the former, and this can be easily verified by taking a sample of urine of a known specific gravity, making dilutions at will, and noting the specific gravities obtained.

A NEEDLE PASSING THROUGH THE INTESTINAL TRACT.

BY ASST.-SURGN. FIROZ DIN MOHROOF,

Lyallpur.

A MAN named L——— was brought to the Civil Hospital, Lyallpur, lying on a native gadda (country cart) on 18th September 1903, at 5 P.M. He was about 19 years of age and could move with extreme pain. He said that he felt a bone in his rectum. He was immediately put on the table and chloroformed. The sphincter was dilated and something was felt lying across the rectum high up; on following to its ends I felt a sharp point, which gave an idea of a needle. I then passed a pair of long forceps, caught one end of the needle and brought it out. It was thickly covered with the fæcal mass. The point end was very sharp and uncovered.

The interest of the case lies in the fact: (1) How this needle got in there. The patient believes that he might have swallowed it. It is probable that it might be so. The needle on examination shows marks of corrosion. The eye of the needle is probably thus eaten out. This is probably the action of gastric juice. But the curiosity of the case lies in the fact: how such a sharp needle could pass through narrow end of pharynx, pylorus and ileocæcal valve, and why should it not have penetrated through the intestinal wall with such sharp ends. How long this needle was in the gastro-enteric canal is not definite. But the course of a needle through it I consider miraculous.

A FATAL CASE OF SLOW AND CONTINUOUS HÆMORRHAGE BENEATH THE DURA MATER PRODUCING SYMPTOMS OF ACUTE ASCENDING PARALYSIS; AND ASSOCIATED WITH HÆMORRHAGE INTO THE STOMACH IMMEDIATELY BEFORE DEATH.

By H. P. JOHNSON,

CAPTAIN, R.A.M.C.,

Station Hospital, Delhi.

It is with a considerable amount of diffidence that I have ventured on the above diagnosis, and I am recording the case in the hope that it will lead to a discussion on the cause of the symptoms, and also as an example of the importance of keeping under close observation all patients who complain of more or less sudden weakness in the limbs, especially if this is accompanied with loss of the reflexes.

Lance-Corporal H. W., 3rd Battalion, Rifle Brigade, a sallow, well-nourished man, aged 24, came to hospital on the morning of 25th September 1903, complaining of great weakness in his legs. His gait was curious in that he lifted his feet very high, giving the appearance that he was stepping over obstacles, and on closing his eyes he immediately lost his equilibrium.

He declared that he had been in perfect health up to two days previously; and, as in his six years' service he has only been in hospital once (for sorethroat), it appears probable that his statement was correct. All reflexes were lost, both superficial and deep; but there was no paralysis of the sphincters. The eyes reacted both to light and accommodation. His speech was somewhat slow and deliberate, but I was unable to find out if this was his usual habit. The tactile sense in the skin of the legs was somewhat dulled, but there was slight hyperæsthesia in the calf muscles.

His temperature was normal on admission, and remained so until his death.

He absolutely denied having ever suffered from syphilis; but his officers told me that he had been a fairly free drinker. On the 26th of October he had absolute paralysis of the extensor and flexor muscles of the feet, and could scarcely feel the battery below the knees. There was also paresis of the thigh muscles. He stated that he felt no pain whatsoever, and that all that was the matter with him was the weakness of his legs. Three days later paresis of both arms occurred; and he had to be given minced food, as he could not cut meat. The paralysis of the legs did not extend, and the muscles of the trunk were never affected. The heart was hypertrophied, and there was a mitral systolic murmur. There was never any albuminuria; but slight œdema over the shins was noticeable from the first. The symptoms, with the exception that the arms became weaker, remained stationary until the early morning of the 5th of November, when he suddenly called out that he was in great pain in his back, his breathing rapidly became gasping, marked cyanosis occurred, his pulse became imperceptible, and he died within an hour.

The *post-mortem* was made five hours after his death. On removing the skull cap, the dura mater over the whole of the upper surface of the brain was found to be purple in colour, and on incising it 28oz. of fluid blood drained away. Most careful examination of the brain and meninges disclosed no vascular lesion. The brain on section was absolutely normal to the naked eye, and there was no excess of fluid in the ventricles. The lungs were normal; but the heart weighed 20oz., and was generally hypertrophied. There was some thickening of the mitral valves, and no ante-mortem clots.

The spleen substance appeared normal, but the organ weighed 12oz. The right and left kidneys weighed 8oz. and 6oz. respectively; the cortices were slightly congested, and the capsules were not adherent. The liver weighed 56oz. and was in a condition of chronic venous congestion. The aorta and large vessels were all normal.

On opening the stomach it was found to contain 12oz. of liquid blood; but there was no ulceration, nor arterial lesion. The intestines were normal. There was no hæmatorrhachis nor hæmatomyelia, and the spinal cord showed no symptoms of disease to the naked eye; but a microscopical examination kindly made for me by Lieutenant-Colonel D. Semple, Director, Pasteur Institute of India, showed a commencing myelitis of the anterior and lateral columns, as evidenced by leucocytic infiltration; but no other abnormal condition. I have diagnosed the case as one of subdural hæmorrhage; but it appears possible that it may have been an abnormal case of Landry's Paralysis, with sudden effusion of blood into the stomach and beneath the dura mater, presumably due to a paralysis of the vaso-motor centre. The liver disease was certainly not sufficient to account for the hæmorrhages; and the absence of albumen in the urine would appear to negative the idea of kidney disease.

THE BAGHDAD BOIL.

By W. H. COX.

CAPTAIN, I.M.S.,

Residency Surgeon, Baghdad.

The inhabitants of the cities of Mesopotamia, Syria and Palestine have been subject from the earliest times to a lesion of the skin, which shows certain definite characteristics, so marked, constant and invariable, and indeed the affliction itself is so widespread that it is, *par excellence*, recognised as *the* disease of those countries. In

Syria the traveller's attention is drawn to it under its name of Aleppo Button, in Palestine it goes by the same appellation, in Persia its name is Sâlek, and in Mesopotamia it is commonly spoken of as the Baghdad Boil or Date-mark. In the North-Western parts of India a different type of it receives the various names of Delhi Boil, Sind Sore, Frontier Sore and Oriental Sore.

Its cause.—It is a disease of cities, or rather of streets which are not properly laid and scavenged. It is never seen in the deserts and villages of the countries it is peculiar to, and in mountainous habitations it is almost unknown. The specific bacillus causing the complaint has not yet been isolated, and the only pathogenic microbes that have been found in, and cultivated from, the pus are various diplococci. There is little doubt that the disease is introduced only *vid* the dust in the air. The surface of the streets in places where the disease is endemic are for the most part bare earth, perhaps hardened with the rubble of half-burnt bricks, and in process of time the traffic converts the surface into a layer of finely powdered dust, which is continually filling the air for a short height from the ground: this dust permeates the upper layer of the human skin, and, given an abrasion or wound of any sort penetrating to the corium, inoculation of the specific bacillus at once occurs.

Prevention.—It will be recognised from this that the only method of prevention is to disinfect or cauterize thoroughly any cut, wound, abrasion or mosquito bite immediately on its occurrence. The Jews of Mesopotamia used to inoculate their infants in a covered part in the hope that a reappearance would be prevented on the face or hands. This custom has died out, as it was seen that inoculation is effective only for a very short time and that only occasionally.

Site.—The part of the body attacked may be anywhere and the ulcer may occur in any axis, but the site is generally the portion most liable to abrasions such as the face, hands and bony prominences, as the ankle, elbow, and inner edge of the ulna. It attacks those new to the country as well as the long-time resident. It is supposed to be limited to those below 45 years in age. The period of incubation is seven to fourteen days.

Onset and type.—The Baghdad Boil season is said to begin in the autumn, but as a matter of fact it is equally common all the year round. It commences as a minute papule, resembling very much an ordinary mosquito bite: it progresses at an extremely slow rate, and often the first intimation of its presence is made known by the exquisite pain produced on contact with a hard substance: this tenderness on pressure is one of the characteristics of the lesion, and by this time the papule has enlarged to the size of a small pea with a ham-coloured surface generally scaly in appearance, and if left alone (as generally happens) it extends under the skin and on reaching the size of a hazel-nut it bursts, exuding a quantity of grumous-looking pus, and disclosing the familiar ulcer, which may be one or other of two kinds, known respectively as the (1) male ulcer and (2) female ulcer.

(1). The male ulcer is oblong in shape like a date seed, hence the name of "date-mark," with an irregular, undermined edge and indurated margin: it is tender on pressure, with a dry uneven surface, and it is extremely indolent in character. The ulcer now either remains stationary in size or it gradually enlarges, sometimes attaining a diameter of two inches: as a rule, the size varies from that of a hazel-nut to an inch in the wider diameter. On reaching its permanent size, the sore retains its characteristic appearance and soon forms a dry pustular scab, which increases in size in successive layers until it becomes a nodular crust, when it drops off, leaving the raw surface of the ulcer bare, and then the scabbing starts afresh.

(2). The characteristics of the male ulcer apply also to the female ulcer, and the only difference is that the latter, instead of forming a dry scab, is forever discharging a pale yellow, watery pus, which adds to the distress of the patient.

Both kinds leave a permanent oval scar.

Treatment.—The methods of treatment of this complaint have been as numerous as the sand of the seashore, but so intractable is it and so little hope has there been in any remedy that with common consent the people leave the sore to run its course. When left alone the ucler continues in the stage described above, and after a year it gradually dies out from exhaustion of the soil. One sore does not protect against another.

In Syria a treatment much in vogue is the application of methyl violet (10 per cent.) to the whole area of the ulcer, but it appears that the popularity of this remedy is as much or more due to its gaudy colour than to any beneficial effect it exerts on the lesion.

The best remedy is, of course, to devitalize the bacillus: in the early stages this is easily done by the application of pure carbolic acid on the point of a match or after scraping out by a tiny curette. In the later stages the only drug which exterminates the microbe is sulphur. This was recognised so long ago as the time of Sargon, King of Assyria:—"One of the streams that water it (*i.e.*, the Plain of the Double Spring time, to the north-east of Nineveh) contains sulphur and has remarkable properties: for though in other parts of the valley of the Tigris the natives and even foreigners are tormented by an eruption of large painful spots which last for a year and then leave an indelible scar, those persons who drink of its water either escape the disease or are rapidly cured."*

The best method of application is to apply strong sulphur ointment (20 per cent.) on resin plaster, with a layer of wool on top to graduate

* *Ancient Egypt and Assyria*, by G. Maspéro.

the pressure of the bandage: this is applied daily for four or five days until the surface of the ulcer looks clean: the sulphur ointment then makes way for Unguentum Picis applied in the same way until granulations appear: these are touched with blue-stone and an ordinary dressing of boric acid ointment applied. In this way healing may be confidently looked for in from one to six weeks. Arsenic in medium doses helps the cure

NOTES ON A CASE OF PROLAPSUS UTERI WITH PYOSALPINX.

By R. F. STANDAGE,
CAPTAIN, I.M.S.,
Residency Surgeon, Bangalore.

NURSAMAH, a Hindu, aged 40 years, was admitted to the Lady Curzon Hospital for Women on 25th February 1903, complaining of retention of urine for nearly two days. A catheter was passed quite easily and a very large quanity of urine drawn off. Her immediate distress being relieved, the patient then complained of constant severe pain in the hypogastric and right iliac regions. She stated that for three months she had suffered severely from aggravation of this pelvic pain during menstruation, which had of late been very scanty. She also stated that she had suffered, lately, from attacks of fever and shivering.

She was married 20 years ago, had only one child, 15 years ago, and had no miscarriages or abortions.

On examination P. V there was a well-marked prolapse of the uterus, the cervix being visible in the vulval opening close against the symphisis pubis. The os was directed to the right and a hard, ill-defined mass was felt behind and to the right. Owing to the resistance of the abdominal muscles the bimanual examination was difficult, but under chloroform the following additional facts were observed:—The body of the uterus, which could be clearly differentiated from the tumour behind, was pushed away to the left and forward against the pubic base, the sound passed the normal distance to the left. In an upward and downward direction the uterus was moveable upon the tumour, to which it was loosely connected by an easily palpable band. The tumour was situated in Douglas's pouch and extended to the right behind the right broad ligament. It was about the size of the head of a baby six months old, was irregularly round in shape and was slightly movable in an upward direction. It was very hard, but on very firm pressure with both hands a sense of elasticity was elicited. Per rectum, bands of adhesions could be felt passing from the tumour to the uterus and the pelvic walls. The ovary on the left side could be made out, and was normal in size and position. The prolapse of the uterus, by the gentle traction with a volsellum forceps, could be made complete, and the uterus returned to its original position by gentle upward pressure.

The patient was put to bed and systematically nourished for the operation, which took place on 14th March, 1903.

A median incision of 3½ inches long was made, extending downwards to 1 inch above the symphisis pubis. On opening the peritoneum omentum presented, which, it was found, could not be pulled up to clear the field of operation. On passing the hand down towards the pelvis over the tumour, it was found that the omentum was intimately adherent to it in its entire breadth. Two Doyen's clamps were placed across the omentum close to its attachment to the tumour, and a row of fine silk ligatures an inch higher than the clamps, the omentum being divided right across between the ligatures and clamps. The hand was then passed down behind the left hand ligament to the back of the uterus and carried to the right on to the tumour, which was found to be intimately adherent to the uterus, the rectum, small intestine (ileum), posterior surface of the broad ligament, and to the vermiform appendix, which closely adhered to its superior and posterior surface. By manipulation with the fingers, the connections with the uterus were separated, the adhesions to the rectum and sacro-uterine ligaments were very lax and easily broke down, but the small intestines was very tightly adherent, and some part of the wall of the tumour had to be peeled off with the gut before it could be set free. The appendix also gave considerable trouble and ruptured while being set free from the tumour, a small, hard stercolith shaped like a date-stone (but about half the size) escaping. The appendix was therefore clamped and put aside for treatment at a later stage. Freed from these connections, the tumour was easily shelled out from its bed on the posterior wall of the broad ligament, and was brought out through the external wound. It was found to be an enormously thickened and dilated Fallopian tube, the ampullar end being the size of a fœtal head, and containing nearly six ounces of greenish, odourless pus. No trace of the right ovary could be found, and it was afterwards discovered flattened out on the wall of the tube. The thickened meso-salpinx was transfixed and the tube ligatured and removed close to the right corner of the uterus. The appendix was then dealt with, being ligatured close to the cæcum, and cut off with the meso-appendix, which was separately ligated. The peritoneal coat of the stump was carefully brought together by a gossamer silkworm gut stitch. There still remained the prolapse of the uterus to be dealt with, and it was decided, as the operation had already occupied nearly an hour, not to employ the method of Stanmon-Bishop, and shorten the sacro-uterine ligaments, though there was ample space to perform it. The uterus was therefore brought into the abdominal

wound, and attached by its posterior surface to the parietal peritoneum by three fine silk sutures (Kelly's method). The uppermost suture passed through the uterine muscle a line behind the Fallopian tubes, and the sutures in the parietal peritoneum took up also some of the subjacent muscle.

The left ovary and tube having been found normal, were returned to the pelvis, the pelvic cavity was irrigated thoroughly with warm, weak boric solution, the suspending sutures on the uterus were tied up snugly, the peritoneum was drawn together by a continuous fine silk ligature, and the parietes united by interrupted stout silk worm gut sutures. The operation lasted one hour and a quarter. I had the great advantage, throughout the operation, of the assistance of Dr. (Miss) Niebel, the Lady Doctor of the hospital, to whom I am also indebted for the notes of the case. Miss M. de Lemos, Assistant-Surgeon, gave chloroform most skilfully.

The patient was somewhat collapsed after the operation, but rallied well, and made an uninterrupted recovery. All the stitches were removed by the 14th day, and she left hospital a month after the operation perfectly well and with the uterus in good position.

Remarks.—I have drawn attention to this case, as it forms one of a series treated by me in the Lady Curzon Hospital, in which prolapse of the uterus occurred together with pyosalpinx. Some cases have been double, others, like this one, single, with one healthy tube, and all, of course, presented differences in the number and extent of the adhesions found. The one similar feature was the prolapse, and I am convinced that this condition is the cause of the tubal infection.

It would be difficult to imagine how the prolapse of a uterus, so surrounded by inflammatory adhesions, could happen *after* those adhesions had formed, but, granted that the prolapse occurred before the spread of infective inflammation to the tubes, and through them to the peritoneum, it is easy to imagine many sources of infection from the fact of the os uteri being in the outer world.

When we reflect on the insanitary clothes worn by the lower class native, or the dirty floors on which they sit, and the many other opportunities for the infection of an exposed mucous orifice occurring in their daily life, the wonder is that every case of prolapse is not accompanied by tubal trouble. In this case the pus in the tube was sterile, so no direct evidence of infection by an organism, which could be assumed to have invaded the uterus from its contact with outside dirt, was available. I hope, however, in some future case to get bacteriological evidence of a continuous infection starting at the exposed os. This case I report to draw attention to the condition and in the hope that other operators may record their experiences of a similar nature.

It is unfortunate that in such cases the history is of no assistance. Those acquainted with the difficulties of case-taking in a native ward will bear me out when I say that such matters as the occurrence of prolapse of the uterus before the onset of pelvic pain, or *vice versâ*, create so trivial an impression on the average lower class native mind as to be entirely unrecorded by the memory.

Prolapse of the uterus is common among native women, and I attribute it to weakening of the utero-sacral ligaments during pregnancy, and to the strain placed upon those ligaments after child-birth by the dragging of the non-involuted uterus on them, when the woman resumes her ordinary life too soon. The yielding of these ligaments allows the uterus to fall, and the subsequent course of events, to produce the condition described in this case, is the infection of the exposed os uteri and the extension of the infection to the mucous membrane of the uterus and Fallopian tubes.

Convinced as I am that an exposed os uteri is a danger to the health and possibly the life of a woman whose condition of life does not admit of her continually wearing a pessary after a colporrhaphy, I advise all native women applying for relief of their condition at the Lady Curzon Hospital to submit to operation. The operation I advise is either a ventro-fixation, after the method of Kelly, somewhat modified, or the operation described by Stanmon-Bishop in the *Lancet* of March 14th, 1903. The latter appears to me to be the more scientific procedure and has the additional advantage of not embarrassing subsequent pregnancies. I cannot speak definitely from my own experience of its results, but I have performed the operation of suspension (or rather, fixation) twelve times, complete relief of a very distressing condition having been given in every case, except one, a very old woman with very lax parietes, in whom yielding, or rupture, of the suspending adhesions must have taken place shortly after leaving hospital. The others have reported themselves from time to time at hospital, and the os uteri in each case has remained in good position, well protected from the invasion of any infective organism, with the lamentable exception of the gonococcus.

Apart from the question of the origin of the pus in the Fallopian tube, this case is of interest owing to the variety and extent of the adhesions met with during the operation, presenting, as it did, an object-lesson on the method of dealing with each in turn. The presence of a small stercolith in the appendix is interesting, too, and might suggest that the appendix was the organ first diseased. I think, however, that it is not unlikely that an appendix, firmly anchored in the pelvis by adhesions, would more readily receive a foreign body than one whose movements were not hampered.

A CASE OF PARALYSIS AGITANS, "PARKINSON'S PALSY" WITH A NOTE ON ITS CAUSATION.

By J. GOOD, M.B.,
CAPTAIN, I.M.S.,
Civil Surgeon, Sagaing, Burma.

Of comparative rarity in the East, the following case presents a few interesting points, especially as to its causation.

Sepoy Kaka Sing, of the Burma Military Police, was admitted into Myinmu Hospital in May, suffering from malarial fever of a severe remittent type, contracted in a notoriously unhealthy station in the Katha district. He states he had fever about 14 days before admission into hospital, and during the six months he was stationed in this particular place, he occasionally got fever. A fortnight after admission into hospital, fever declined, leaving him weak, anæmic, complaining of tremblings of extremities and a difficulty in doing things for himself. He was then transferred to Head-quarters' hospital at Sagaing, 28th June 1903.

On admission, patient, who is a young Sikh of good physique, 22 years old, and two years' service, presented the following appearance lying in bed. Face immobile, expressionless, eyebrows drawn up, leaving the whole upper lids exposed. There is a stammering hesitation before speaking, then the words come rapidly, but distinctly; voice is shrill. There is tremor of head and all extremities. Head moves vertically, no nystagmus. Attempts at voluntary movements check the movements to a slight extent. Patient cannot thread a needle and his writing is zig-zag.

Weakness is more apparent than real, but is present. On rising all movements are slow and deliberate.

Gait.—Head and chest bent forward, arms held apart from sides and flexed at elbows. Legs wide apart. Steps short and hurried "propulsion."

Reflexes normal, no localised symptoms. There is no sign of his ever having had chancre or syphilis; he states he never suffered from venereal of any sort.

There is no family history of any nervous complaint. No malarial parasites were found in the blood. He had a long course on quinine. Blood did not agglutinate in a 1—20 dilution enteric bacilli. There is no history of drunkenness.

Causation.—There seems to exist a doubt that this disease is caused by malaria, but in this case it undoubtedly was. There is no history of venereal disease, wettings, trauma or exposure, only of malaria. A man who was never ill until attacked by slight fever nine months ago followed by slight attacks, which culminated in the severe type above referred to. It seems to me then that paralysis agitans, though happily of comparative rarity, may be reckoned on as another of the sequences which follow in the trail of malaria, and is one of the most distressing to patient and his friends. Patient is still in hospital on August 6th, and the disease is slowly advancing. Arsenic, opium, potassium iodide and bromide have been tried without effect.

NOTES ON A CASE OF PUERPERAL ECLAMPSIA TREATED BY HYPODERMIC INJECTION OF MORPHIA.

By C. BARRY,
CAPTAIN, I.M.S.,
Civil Surgeon, Maymyo.

Patient was an Eurasian, aged 34 years, she commenced menstruating at the age of 13 years, and, when occurring, her periods were regular monthly, lasting 4 to 5 days and of normal quantity. At the age of 13 years, shortly after she commenced to menstruate, she was married and has had altogether 12 pregnancies. All ended normally except the last two, which ended in miscarriages at 5 and 3 months respectively.

Her present pregnancy dated from 8½ months ago and was apparently normal in every respect.

On October 19th patient experienced intense headache with vomiting and pain and stiffness in the back of the neck; the temperature, when she was seen, was 103°, and the urine contained about ¼th of albumin, but was apparently normal in quantity. A hypodermic injection of half a grain of morphia was given, followed by 40 grains of potassium bromide. The patient slept well and the vomiting ceased; temperature fell to normal. On October 21st the pain in the head returned, as also did the fever; temperature being 101° F. Forty grains of potassium bromide were given.

She slept only however for about one hour, and on waking at 9 P.M., was seized with an epileptiform convulsion; this fit was followed by others throughout the night, and when seen at 8 A.M. on October 22nd, she had had eight fits, lasting from 2 to 3 minutes each. The patient was now in a semi-conscious condition, and complaining of intense headache and pain in the back of the neck. The tongue was swollen and badly bitten, the respirations hurried and shallow, and the pulse feeble, 120 to the minute, urine scanty and loaded with albumin. One grain of morphia was injected hypodermically. The patient relapsed into a lethargic condition, but could be roused to take food. The fits ceased. Patient lay 20 hours in this condition when labour pains came on and she was quickly delivered of an healthy living child. After labour was completed no more morphia was given, the fits did not recur, and the patient progressed normally. The albumin disappeared from the urine in 48 hours. Beyond complaining of some stiffness in the back of the neck the patient had no abnormal symptoms and made a rapid recovery. The child was a strong healthy boy of normal weight.

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were irregular congested or cyanosed patches scattered over the body. Œdema was a noticeable feature, below the eyes and in the lower part of the legs and ankles, but this was not a constant symptom. The fever did

another twenty-three were found under one coverslip. The writers are of opinion that trypanosomiasis in the Native of Gambia is a peculiarly mild disease, and that it is at present impossible to recognise it clinically with

accuracy owing to the lack or slightness of the symptoms.

Equine trypanosomiasis, in the Gambia appears to be a chronic disease, occurs throughout the colony, and is more prevalent in the rainy season near the river. Thirty-six horses were examined, and ten were found infected. The horse is the only animal in which Drs. Dutton and Todd found a *pathogenic* trypanosome, this parasite seems to differ somewhat from the other varieties already described, and it was not found to infest cattle and other domestic animals. The first symptom observed is loss of energy, while the horse appears fit and with a sleek coat. The temperature is only slightly above normal, and not many parasites can be found microscopically. A few weeks later emaciation is appreciable, the horse droops his head, his eyes are lustreless, and he is manifestly weaker. There are periodical rises of temperature, at which time parasites are obtainable from the blood. In another month's time the ribs show, the abdomen swells, the scrotum and testes are relaxed, and there is an occasional watery discharge from the eyes. In none of the horses did the observers notice any marked œdema of the abdomen, scrotum and legs, or the staring coat which has been described elsewhere. The emaciation is progressive, and the animal has a characteristic apathetic, listless attitude from increasing debility. Parasites are almost continuously found in the blood, and the temperature fluctuates, rising to 105°F. *Post-mortem.*—A general enlargement of the lymphatic glands was observed, fluid œdema of the sheath of the penis, with amber-coloured fluid and flakes of lymph in the peritoneal, pleural and pericardial cavities. There was no enlargement of the spleen. Deterioration of the blood was not detected until a late stage in the disease.

The *T. gambiense*, found in the human subject, averages 20 microns in length inclusive of flagellum, and its width varies from 1·8 to 8 microns. The *equine* trypanosome is small and tadpole-shaped. Its length is 11 to 13 microns, including flagellum, and its width 0·8 to 1 micro. This description applies to the early stages of the disease; whereas in the last stage two fairly constant types of parasites were seen, one long and the other stumpy. The writers absolutely failed to transmit trypanosomiasis from infected to healthy animals through the agency of the tsetse fly, *Glossina palpalis*; nor could they ever find any evidence of the parasite in these flies on dissection of their heads and probosces immediately after feeding on animals in whose blood the parasites were very numerous.

The bibliography of Trypanosomiasis has assumed imposing proportions. In the *Emergency Report on Surra* by Salmon and Stiles, issued by the Bureau of Animal Industry, Washington, U. S. A., a very complete bibliography is presented by A. Hassall, M.R.C.V.S., which brings the subject up to 1902. Dutton and Todd give a list of seventy-two more recent publications. Miss Polk, Librarian of the Bureau of Government Laboratories in America, has prepared a list of over two hundred writers, and a list of 475 references covering over twenty pages for a monograph on *Trypanosoma and Trypanosomiasis, with special reference to Surra in the Philippine Islands*, by Dr. W. E. Musgrave and his assistant, Mr. M. T. Clegg. They use the term Trypanosomiasis in the same manner as is commonly accepted for other diseases such as filariasis, anchylostomiasis or uncinariasis,—all clumsy modern terms, however convenient they may be as generalisations. They give a list of over eighty synonyms in colloquial use in different countries for trypanosomiasis, which they describe in the following terms:—

"The disease is a specific infection of many of the lower animals, and occasionally of man, caused by trypanosoma. It occurs in epidemic form over large areas of tropical countries, and is usually more severe during the rainy season. It is characterized by a period of incubation, followed, in most animals, by a remittent, intermittent, or, less frequently, relapsing fever; by the presence of trypanosoma in the circulating blood, which in some animals are numerous in proportion to the temperature; by progressive anæmia and emaciation; by a catarrhal condition of the mucous membranes of the eyes and nose; by roughness of the hair, which in many instances falls out; and by subcutaneous œdema, more commonly of the posterior extremities, genitals, and belly. In the later stages paresis of the posterior extremities is very common. The mortality amongst most animals of economic importance is 100 per cent.

"There are found in most animals at *post-mortem*, in addition to the evidence of severe anæmia, certain changes in the spleen, the most constant being enlargement and a peculiar

mottling. Taken with the other principal lesions, such as lymphatic hyperplasia; peculiar, yellowish, gelatinous, subcutaneous and subserous infiltrations; an enlarged liver and the accumulation of fluid in the serous cavities, it makes an anatomical picture which is rarely excelled in chronic diseases peculiar to man."

It appears that in 1842 Caladrini described a disease in South America, called *mal de caderas*, which answers to trypanosomiasis. From the Amazon it spread rapidly over Brazil to Paraguay, and thence over a large area of the continent, killing thousands of horses. Under the name of *dourine* the disease was known in various places during the latter part of the eighteenth century. In 1880 G. Evans brought *surra* to prominent notice, which had been known for generations amongst the natives of India, and he demonstrated trypanosoma as the etiological factor. Animals in Mauritius, became infected only as late as the South African War, and in Java during 1900.

Bignami and Celli described a parasite resembling Tr. lewisii in a patient supposed to be suffering from malarial fever in 1886. Nepveu reported trypanosoma in the blood of seven people in 1898, and Dutton, Ford and Manson have described the same condition in 1902. Musgrave and Clegg deal with the *surra* that was introduced into the Philippines in 1901. They consider that *surra* should be the only popular name in use, and they believe it to be caused by Tr. evansii, with which they think Tr. brucei and others are identical.

As regards the life cycle of the trypanosoma there is a good deal of uncertainty; some observers believe all the phases to occur in the blood of one animal, while others favour the existence of an intermediate host. The adult free parasite is said to multiply by longitudinal division, encystation of the products follows, then division into isogametes or division into macrogametes and microgametes, conjugation of the isogametes or of the micro and macrogametes, the resting stage or zygote, and division into young. The phenomenon of agglutination has been described by many observers; but Musgrave and Clegg consider the condition as uncertain and inconstant, and our present knowledge of the subject as unsatisfactory. They have seen the rosettes and other forms of agglutination, but they were too inconstant and occurred under too many conditions to be of any real significance. They set no value on agglutination for diagnosis, or as an index of immunity or of susceptibility.

Salmon and Stiles describe the general characters of the trypanosoma family thus:—

"Flagellate parasitic forms with one chief flagellum directed anteriorly; in some forms a secondary flagellum directed posteriorly; body usually with two angles, and wound more or less in the form of a spiral; one angle of the body provided with an undulating membrane One nucleus and one centrosome present."

Their place in nature is under *Protozoa*, class *Mastigophora*, sub-class *Flagellata*, order *Monadida*, family *Trypanosomidæ*, genus *Trypanosoma*. Subgenera seem to depend chiefly on the flagellum. Thus Doflein has (1) *Trypanosoma*, major flagellum present, absent, or very short and thick. (2) *Trypanomonas*, undulating membrane continued posteriorly into a flagellum, so that two flagella are present; (3) *Herpetosoma*, posterior flagellum absent, undulating membrane ending on or before end of body. This has been objected to by Salmon and Stiles, who divide the genus into *Trypanosoma* and *Trypanoplasma*; the former with one flagellum extending from the centre some along the undulating membrane and becoming free at the anterior extremity; the latter with two flagella, anterior and posterior.

A large number of varieties have been described and named, more with reference to the host or after some observer. Here there is much confusion from overlapping. Trypanosoma of kinds have been found in fish—mudfish, sole, tench, pike; in oysters; in frogs; in leeches; in birds—fowls, pigeons, ducks, geese; in mice, rats, hamsters, guinea pigs, rabbits; in sheep, deer, goats, oxen, the ass, horse, dog, monkey, and in man.

THE PASTEUR INSTITUTE OF INDIA.

The Third Annual Report of the Pasteur Institute at Kasauli, issued by Lieutenant-Colonel D. Semple, R.A.M.C., shows a remarkable increase in the amount and variety of work done, an increase that is doubly a cause for gratulation, both on account of the extending usefulness of the institution and of its greater appreciation by the public. The number of patients treated was 584, of whom 269 were Europeans and 315 Natives of India; this total exceeds the previous year's by 41 and the first year's by 263. Of this number there were 6 failures, amongst

Natives, all under class C, which gives a percentage of 1·02; but in each of these cases the nerve centres were affected before treatment could be completed.

All cases treated are tabulated under one of three classes:—A includes those bitten by animals proved to have had rabies, either experimentally or by the supervention of the disease in other people or animals infected from the same source; B comprises those bitten by animals certified to by a Veterinary Surgeon as rabid; C applies to those bitten by animals suspected of rabies. Each class is divided into three sub-classes, according as the person has been bitten on the head or face, on the bare skin elsewhere than on the head or face, or bitten through clothing. The greater success amongst Europeans is explained by the bites being less severe, the wounds more promptly and better attended to, earlier anti-rabic treatment, more vigorous and better fed subjects

In order to obtain an increase of the figures under class A it should be kept in mind that only a small portion of the brain, medulla or cord need be despatched in sterile neutral glycerine for diagnostic purposes. If the complete brain be sent in alcohol, either putrefaction or destruction of the virus are likely to occur, and thus the diagnostic test becomes impossible.

With a view to diminish the time required for immunity in badly bitten, or late cases, anti-rabics serum has been prepared from young ponies, and this has been used in addition to inoculations with rabies virus. The serum confers an immunity, which is quickly and easily acquired, but which soon disappears, hence it is followed up by the usual treatment.

During the year anthrax vaccine, reliable for three months, was obtained by growing a fairly virulent anthrax culture in broth at a temperature of 42°C. and replanting in fresh broth daily, until a culture was secured which killed a rabbit but not a sheep. This was grown and replanted daily at the same temperature, until a culture was got which killed a guinea pig but not a rabbit. Strong and weak vaccines were prepared from these two standard cultures by inoculating broth and allowing growth to proceed at 37°C. for ten days. Of this vaccine 1 cc. is a safe dose for a horse, the weak vaccine is injected hypodermically, and the strong vaccine a fortnight later.

Anti-venomous serum prepared from horses immunised with cobra-venom has been distributed all over India. One cc. of this Kasauli antivenene neutralizes 1·1 milligramme of dried cobra-venom. If a case of cobra-bite is seen early a full dose of the antivenene should be injected hypodermically; but if symptoms have set in, then the injection should be administered intravenously into one of the veins of the arm. In addition to a ligature being applied above the bite, hot coffee or tea may be given, but the use of alcohol, ammonia or strychnine is condemned.

During the year ten Medical Officers have been engaged on bacteriological or other laboratory research work, *e.g.*, improvements in the preparation of calf lymph, cerebro-spinal fever, the preparation of diphtheria and tetanus antitoxins, serum diagnosis, malarial parasites and a variety of other subjects.

The financial condition of the Institute is flourishing. The balance amounted to Rs. 70,179, the expenditure to Rs. 36,982, and Rs. 25,000 were invested in Government securities, bringing the invested capital up to one lakh. A house at Kasauli has been generously presented by H. H. Sir Ranbir Singh, K.C.S.I., Kanwar Sahib of Patiala, and Mr. Wadia, C.I.E., of Bombay, has made a donation of Rs. 10,000 to be invested in Government securities. The 'Manor House' Estate, occupied by the Institute since its commencement, has been purchased at a cost of Rs. 47,000 out of the Rs. 50,000 presented by the Government of India, and buildings have been erected within a convenient distance from the Institute for the poorer class of European and Native patients.

PLAGUE AT SYDNEY.

THE Government of New South Wales have published a lengthy and elaborate *Report of the Board of Health on a Second Outbreak of Plague at Sydney*, 1902, comprising 80 folio pages, written by the Chief Medical Officer of the Government, Dr. J. Ashburton Thompson. Amongst numerous features of interest there is the fact that it is a very complete analysis of an outbreak of plague in a civilised white urban population living under conditions similar to city communities in Europe as regards clothing, housing, customs and local government. It also shows what energetic sanitary measures can accomplish when they get something like a fair chance. The first epidemic in Sydney ceased in August 1900, and after an interval of fifteen months one case occurred in November

1901; the second case occurred 34 days later in December, and the third case 35 days after that in January 1902; after this there were 136 cases, the last case occurring in June 1902. In the former epidemic there were 303 cases, 103 deaths, or a mortality of 34·0 out of a population of 487,932, and the sanitary measures cost Government £176,000. In the latter epidemic there were 139 cases, with 39 deaths or 28·0, and the cost was £24,000. The policy adopted in 1902 was to use only the infectious wards of one hospital for the isolation and treatment of plague cases, having first made the wards rat-proof; beyond prompt disinfection of the dwelling the other members of the household were not interfered with, there was no segregation of contacts; infective areas were quickly and thoroughly cleansed, but there was no interference with trade or with the movements of the inhabitants. The policy outlined for the future is not so much to prevent the importation of plague rats nor to attempt extermination of rats in a particular locality, though both have proved valuable measures, as to habitually exclude all rats from inhabited premises. Dr. Thompson thoroughly believes in epizoötic plague as the causal nexus in human plague, that rats or their fleas convey the disease to man. He sets aside Nuttall's objection that rat-fleas do not bite man by pointing out that there are other fleas than the *Typhlopsylla musculi* and the *Pulex irritans* or the *Pulex fasciatus*, and shows that Tidswell has proved the *Pulex pallidus* is far commoner on rats in Australia and also in Bombay.

Moreover both the two last-named varieties *do* bite man when they are hungry, although they may not infest man as a rule. He also cites the experiments of Raymond and Gauthier at Marseilles, and Elkington at Bombay, as proof that fleas from infected rats can and do infect healthy rats. Dr. Thompson sets no store on infection from the sick direct, or place-infection, as theories explaining the propagation of an epidemic. He leans to the view of infection by indirect means, and ventures the following conclusions:—That plague is more often communicated from rat to rat than from rat to man, that plague in the rat being a septicæmia it is hardly more communicable from rat to rat by mere contact than from man to man, that consequently some special factor is necessary, *i.e.*, the flea. Incidentally in describing an outbreak of plague amongst the animals in the Zoological Garden he points out that few plague-stricken rats fall to the rat-catcher, the sick ones have not energy to crawl into rat-traps. Between the 16th November 1901, and the 31st March 1902, it is recorded that 47,285 rats were caught or killed, of these 1,730 were examined in the laboratories, and only 40 were found to be infected. Between the 1st April and the 14th July 1902, there were 28,618 rats delivered at the laboratories and only 65 were found infected. After this nearly 30,000 rats were taken, and out of 16,000 examined not one had plague. Thus it appears there was a general coincidence in time between the occurrence of the plague in man and the finding of plague-rats in Sydney.

Dr. Thompson considers that the flea hypothesis helps to reconcile apparent contradictions, to explain the erratic incidence of plague, and also to solve the difficulty of there being no great probability of infection to man from plague-rats when they are present on inhabited or frequented premises. "For we know that the flea which most commonly infests the human race is of one species, while the fleas which infest other sorts of animals are different from it and (as regards several species) from each other; whence it seems evident, *à priori*, that species so usually associated with this or that sort of animal as to be found with certainty upon it when they are searched for, probably have a predilection for their peculiar hosts. On putting this probability to the test of experience, it is found to be so far well-founded that the species of fleas which infest rats seem, on the one hand, not to infest man, but, on the other hand, to have no repugnance to him. They will feed freely upon his blood if they be hungry. Hence it is plain that there are at least two chances against man's being bitten by any of the species which infest rats. One is that fleas which have left a plague-rat may never come within reach of man though on the same premises with him; the other is that, if they reach him, they may do so at a time when they are not so urged by hunger as to bite an unaccustomed host. These chances amply suffice to account for the frequency with which all the persons who inhabit premises which are known to have been visited by plague-rats escape, as well as for the rarity with which more than one person is attacked among a household which consists of many, all of whom are susceptible, and all of whom appear—but only appear—to have been equally exposed to danger."

LONDON LETTER.

THE DUM-DUM SPLEEN.

THE worst cases of malarial cachexy, with the largest spleens and livers and the profoundest anæmia, which are admitted into the Royal Victoria Hospital, Netley, are those whose disease was originally contracted at Dum-Dum or Barrackpore. These cases have become a sort of byeword at Netley and one instinctively pronounces a case with very pallid face and very tumid abdomen as a Dum-Dum case. In such cases it is very rare to find a parasite in the peripheral blood, though diligent search is always made; and the temperature conforms to no known type being exceedingly erratic, subject however to sudden jumps and falls. These cases also resist quinine, are very intractable, and very prone to pulmonary and intestinal complications which often prove fatal. Examining a smear taken *post-mortem* from a spleen of this kind, Major W. B. Leitsman, R.A.M.C., in 1900 found some strange ovoid bodies with a large and small nuclear mass of chromatin. He published his observations in the *British Medical Journal* of 30th May 1903, and drew attention in this paper to the strong resemblance between the bodies observed by him in 1900 and the remains or involuted forms of trypanosomes taken from a white rat dead of Nagana. Sketches are given of the appearance presented by both specimens. Major Leishman threw out the suggestion that these anomalous cases of so-called malarious fever might possibly be in reality cases of trypanosomiasis. In the *British Medical Journal* of 11th July 1903, Captain C. Donovan, I.M.S., states in a short memorandum that he had found bodies similar to or identical with those described by Leishman in material taken from three dead and one living spleen. No trypanosomata were found in the blood of the latter. Donovan's preparations have been examined by Leishman, and the identity of the bodies in both cases has been admitted. In a later paper (*B.M.J.*, November 28th), Captain Donovan states that Laveran and Mesnil consider that these bodies belong to the genus *piroplasma*—the same that causes the Texas Cattle fever, but probably a different species. Major Ross who has thrown himself with characteristic energy into the subject thinks that the forms are parasitic and belong to a new geneus of *sporozoa*. Such is the present position of the question. We seem to be on the eve of an important discovery, and whether the bodies are new and special and, as Donovan supposes, the cause of one of the anomalous fevers of India, or whether they are involution forms of some well-known parasite—whether, moreover, the infection is a primary or a secondary one—these are points that can only be cleared up by additional research.

WHAT IS KALA-AZAR?

Leishman in his original article throws out the hint that kala-azar is perhaps due to trypanosomiasis, and Manson in the recent edition of his book makes a similar suggestion. This raises a new speculation regarding the nature of this much-debated disease which has been variously considered to be (1) a severe form of ordinary malarious fever; (2) an infective form of malarious fever of severe type (Burdwan fever); (3) anchylostomiasis original or engrafted upon malarial cachexia; (4) Malta fever of a specially virulent and fatal description. I dare say that some of the able men practising in Assam will lose no time in examining material derived from dead and living spleens belonging to patients suffering from kala-azar with a view to ascertaining whether they present forms similar to those seen by Leishman and Donovan. It seems quite certain that there are no trypanosomes present in the blood of such cases. They could not possibly have escaped the keen eyes of Rogers, Ross and others who have so frequently and carefully searched for malarial parasites, there then is another problem which demands investigation. Verily we live in an age of great advances and accumulating interests.

THE CANCER ENIGMA.

This appears to be as far from solution as ever. The present state of our knowledge regarding the origin of cancer has recently been stated with admirable lucidity by Mr. Henry Morris of the Middlesex Hospital in a lecture delivered at the Royal College of Surgeons on the 9th of this month. Mr. Morris includes under the term cancer both carcinoma and sarcoma. These tumours are certainly both malignant; but structurally and developmentally in some respects etiologically they present wide differences, and as regards sarcomata the degree of malignancy of different varieties is by no means equal. The lecturer uncompromisingly rejects the microbic theory. "Neither fission fungus," he declares, "yeast fungus nor psorosperm, neither bacterium, blastomycete nor protozoon,

has up to the present moment been satisfactorily shown, in spite of years of patient study by many skilled workers, to be in any sort of causal relation to these diseases." He also rejects Thiersch's "lost balance" theory, which postulates morbid activity on the part of epithelial tissues in consequence of impaired vitality of the tissues on which they rest. On the other hand, he espouses and advocates Cohnheim's "tumour germ" theory, as modified by Senn and others so as to include germinal masses dislocated, isolated and included by injury and disease as well as by error of development. Stimulation of the germinal séquestre, combined with impaired resistance of the surrounding tissue, account in either case for the malignancy of the growth. He elaborates his theme with ingenuity and adduces clinical, experimental and pathological evidence in its support. On the other hand, Mr. H. G. Plimmer in a paper published in the same number of the *British Medical Journal* (December 12th), which contains a report of Mr. H. Morris's lecture and is mainly devoted to the subject of cancer, argues strongly in favour of the parasitic theory of cancer. The causation of malignant growth, must for the present remain an open question; but whether we adopt one or other of these theories the line of practice is clear and rational—namely, to remove the disease at the earliest possible moment. It is only by so doing that we can hope to prevent migration whether of morbidly active tissue, germs, or malefacient parasites to other parts of the body, or their dissemination by proximal or distal conveyance beyond the reach of the knife or the possibility of extirpation.

Arsenical Neuritis.

The Commission which was appointed to investigate the outbreak of neuritis caused by arsenic in beer in Northern and Central England has recently submitted an elaborate report on the subject. They fully confirm the view that the adulteration of the beer was caused by the use of impure acids containing arsenic used for the manufacture of glucose and "invert" sugar. The number of cases amounted to over 6,000 and of deaths to at least 70. Many deaths returned as due to, "alcoholic neuritis" "alcoholism," "locomotor ataxy," &c., were probably caused by arsenical poisoning. Since the exposure of the cause of the outbreak and discontinuance of the use of impure acids the number of cases of "alcoholic neuritis" has decreased. A curious fact recorded by the commissioners is that in towns where many cases had occurred the birth-rate was sensibly lowered. They made some investigations regarding beri-beri in ships, and the possibility of such cases being due to arsenic, and found that there was no substantial ground for such a belief. Still, in the event of limited outbreaks in British regiments, this possibility should be borne in mind.

K. McL.

17*th December*, 1903.

Current Topics.

The Lister Institute of Preventive Medicine.

The Jenner Institute of Preventive Medicine has been rechristened under the name of Lister. A new laboratory has been set apart at Chelsea for special cancer research under the charge of Mr. H. G. Plimmer, M.R.C.S., and Dr. A. Paine. There are departments for bacteriology, pathological chemistry, chemistry and photography. The Antitoxin department has been transferred to Queensberry Lodge, Aldenham, Herts. Yersin's Serum and Haffkine's Prophylactic Fluid are prepared and kept in readiness for distribution in the United Kingdom or in the Colonies, should an outbreak of plague occur. Considerable quantity of diphtheria antitoxin, tetanus antitoxin, antistreptococcic serum and Coley's fluid have been distributed. Research work is being carried on in all departments. The Governing Body have issued a letter to the India Office from which the following is an extract:—

"We should be glad at any time in return to show any of your medical men our laboratories at Chelsea, and at Aldenham near Elstree. The latter are isolated, and it is there we prepare our sera and antitoxins.

"The Institute at Chelsea is principally given up to research of the highest scientific character into disease problems. We have there a number of skilled bacteriologists, chemists, etc., the aim of the Governing Body is that we should do for England what the Pasteur Institute does for France, and we hope to become the standard institution for reference in this country on the present knowledge relating to such problems."

The Indian Aconites.

Dr. O. Staff, of the Kew Gardens, read a paper on *The Botany of the Indian Aconites* at a meeting of the Therapeutical Society. He pointed out the existence of at least a score of distinct species of aconite in India, some of these are poisonous and allied in characters to the Aconitum Napellus, others are non-poisonous and are used as tonics. The tuber-like

roots of both are sold in the Indian bazars, the poisonous kinds under the name of Bish or Bick, from the Sanskrit word for poison—Visha. They are brought from the various parts of the Himalayan range, *e.g.*, Sikkim and Nepal, Kumaon and Sirmur. The Calcutta bazars get A. spicatum from Nepal and Sikkim. The Punjab gets A. chasmanthum from the hills north of Peshawar. The United Provinces obtain A. Balfourii and A. ferox from Kumaon, and A. demorrhizum from Garhwal.

THE VENTILATION OF THE HOUSE OF COMMONS.

During the past summer the air of the House of Commons was carefully investigated. Mr. Atkinson Butterfield with an ingenious apparatus estimated the proportion of carbonic acid present at various points, and incidentally the proportion of moisture was ascertained. The results of analysis gave an average of 3·37 volumes of carbonic acid in 10,000 volumes of air, with a maximum of 3·74 and a minimum of 3·14, figures which contrast not unfavourably with the average of 3 volumes in pure country air, and 3 to 4 volumes in the air of towns in the absence of fog. The means for renewal of air are so good as to avoid a rise of 2 volumes of carbonic acid over that present in the incoming air, whereas various sanitary authorities think 10 volumes a fairly reasonable standard to aim at for schools, factories and workshops. Mr. Graham-Smith undertook a bacteriological examination of the air at the same time, and he found that the air in the Debating Chamber during a sitting is remarkably pure under existing circumstaces, 5·8 per litre as a mean of eleven experiments. Full details of the investigation are to be found in two papers published in the *Journal of Hygiene* for the last quarter of 1903.

THE HARVEY MEMORIAL FUND.

In response to our appeal made in the last number for contributions towards the deficit of Rs. 300 we have received a second subscription from Lieut.-Col. D. G. Crawford, I.M.S., Hughli, amounting to Rs. 32.

THE LATE MAJOR A. E. GRANT, I.M.S.

Major A. E. Grant, I.M.S., was obliged to leave Madras in January, 1902, on account of his health, at which time he was Deputy Sanitary Commissioner, Inspector of Vaccination, and Professor of Hygiene and Bacteriology in the Medical College at Madras. He entered the service in 1888, and from 1890 onwards he was connected with the Medical College as Assistant Physician and Professor of Hygiene. In 1901, he officiated as Sanitary Commissioner for nine months. While at home he was offered the appointment of Superintendent of the Bacteriological Laboratory and Central Vaccine Institute in Madras, which had been newly created, the scheme for which he had much at heart and which he had been partly instrumental in initiating. Owing to the state of his health he was obliged to refuse, and he was most reluctantly going to retire from the Service from the same cause. During the past year he started a home at Ennore in Bournemouth for the dietetic treatment of diabetes, chronic liver and bowel complaints, obesity, and other troubles not requiring confinement to bed or hospital treatment. He was a contributor to the columns of the *Indian Medical Gazette*, and was engaged on an article on Liver Chill at the time of his death. Two instalments of the paper have been printed; but he wrote early in December that he was too ill to write the third part then, though he hoped to send it in time for the February number. We regret to learn that he died on the 13th December, 1903. The service has sustained the loss of an able officer, and a promising career has been cut short.

JAMMU CENTRAL JAIL, KASHMIR.

The Superintendent of Jails in Jammu, Dr. B. R. Sawhney, M.B. (Durh.), has written a thoughtful pamphlet on prison management entitled *A Brief Note on the Past and Present Condition of the Jammu Central Jail, and its Future Requirements.* The daily average of the jail population has increased by about one hundred prisoners during the past ten years. Dr. Sawhney points out that though the Police and Judiciary may perform their duties with the utmost efficiency, yet the penal system may not prove a success in the repression of crime unless the prisons are conducted on sound reformatory principles. A dacoit, for example, may get a long sentence, yet he may have an easy and a healthy time in jail, mixing freely with other congenial jail-birds, and with little irksomeness beyond routine, restrictions on his liberty, and the exaction of a moderate daily task. The writer would prefer to make the jail such a place that the prisoner would be glad to get out of and imbued with a wholesome dislike ever to return to it. For first and youthful offenders he considers whipping or fining more appropriate than imprisonment. For adults he would have the jail well equipped with varied means of exacting real hard labour, and for notorious bad characters he would have ample unicellular accommodation. He is altogether against the indiscriminate mixing of prisoners both at work and when off work, and he has adopted the following classification for the separation of criminals:—

A. Dacoity with murder; B. Simple dacoity; C. Theft and robbing as a life pursuit; D. Casual theft or burglary; E. Commission of murder to avenge honour; F. Infliction of serious hurt under special provocation; G. Repeated breaches of jail discipline; H. Exemplary behaviour in jail, irrespective of the nature of the original

crime. This arrangement he has found useful in maintaining discipline, and an incentive to good conduct amongst prisoners, also an aid to warder supervision, the experienced warders being in charge of the worst characters.

For a jailor he prefers an intelligent licentiate of a medical school to the usual type of man promoted from the ranks of the Jail Department. Illiteracy amongst the warders he finds a serious drawback, also the fact that they are usually underpaid.

His account of the Jammu Jail reveals it as rather a primitive institution, and distinctly behind the times as regards the buildings and accommodation provided.

MEDICAL MISSIONARIES IN INDIA

In 1895 there were 140 missionaries in India with medical qualifications. This number has since been steadily augmented year by year until the total is now 265, of whom 112 are men and 153 women. At this rate their numbers will be doubled within the decade. In the last quarterly issue of their journal, *Medical Missions in India*, they bring most convincing facts to prove the fallacy of Mr. Hutchinson's statement that Leprosy in India has been spread by Christianity, especially by Roman Catholics.

Apparently Mr. Hutchinson, like so many other cold-weather tourists in India, missed the interpretation to be put on the facts and figures he collected. Because there were so many Christians in leper asylums, therefore they must be the victims of *Vendredi maigre*—fish and fasting. Unfortunately for this theory the missionaries can show that the vast majority of these lepers were Hindus or Mohamedans when they contracted the disease, and that they became converts to Christianity *after* becoming inmates of Leper Asylums.

THE TABLOID SUBSTITUTION CASE.

Messrs. Burroughs, Wellcome & Co. are to be congratulated on the judgment pronounced by Mr. Justice Byrne, which was in their favour on all points. They sought to restrain Messrs. Thompson and Capper, a firm of retail chemists, having large establishments in Manchester, Liverpool and towns in the north of England, from passing off goods not of Burroughs, Wellcome & Co.'s manufacture, when "Tabloids" or "Tabloid" products were prescribed. During the course of the case, which lasted a week, it was definitely proved that amongst doctors and druggists "Tabloid" was generally recognised to mean preparations of Burroughs, Wellcome & Co.

The direct question of substitution, which is a serious one where drugs are concerned, was complicated by the defendants raising a secondary issue on the validity of the plaintiffs' trade mark "Tabloid." Basing their attack on the fact that Burroughs, Wellcome & Co. have refrained from familiarising the public with their medicinal preparations, and have advertised them solely to the medical profession and drug trade, the defendants endeavoured to prove that the word "Tabloid" had no special reference to Burroughs, Wellcome & Co.'s products.

As to the acts of substitution, definite evidence was submitted in a dozen cases, where in response to prescriptions and verbal requests other drugs were passed off when Burroughs, Wellcome & Co.'s preparations were asked for. In three instances not only was the firm's trade mark "Tabloids" used in the prescriptions or orders, but the full name or the initials "B. W. & Co." had been added. The admissions made by the defendants' manager under cross-examination settled the question of substitution.

One important result of this case is to strengthen the medical practitioner's right to expect that his prescription will be faithfully and scrupulously dispensed by the pharmacist. The College of Pharmacy of New York enunciated this principle very clearly about a year ago in the following resolution:—"That the College of Pharmacy publicly condemns all acts of substitution, whether in prescription work or in ordinary trade; that it declares such practices to be violations of just dealing, opposed to the principles of professional ethics, and subversive to good morals, that we will therefore exert our utmost influence, both as individuals and as an institution, to discourage such practices, and to promote professional and commercial confidence."

THE HEALTH OF MALDA, WITH A MEDICO-TOPOGRAPHICAL SKETCH OF THE DISTRICT.

By H. SEN, M.B.

The district is situated at the very centre of the wide plains forming the lower basin of the Ganges and the Brahmaputra. It slopes toward the south and is divided into two almost equal halves by the Mahananda, a tributary to the Ganges, flowing from north to south. The two tracts are of different levels. The one to the east is 30 to 40 feet higher than the one to the west. The geological formation of the two divisions differs. The low-lying western half is of pure alluvial formation; the higher eastern half is of tenacious clay formation. The greater part of the former successively formed the bed of the restless Ganges which has been rolling over it from east to west and now forms its western boundary, being checked by the chain of Rajmahal Hills. There are three other smaller streams in the district all connected with the Mahananda. The banks of this river are much higher than the general level of the country, and the range of water-level on it is as high as 40 feet. In the dry weather the river becomes fordable at several places, and in the rains it overflows its banks and submerges the country

to the west. The eastern half, though on much higher level and above the level of the flood water, turns into marshes at several places during the rains and is much cut up by ditches, water-courses, jhils, &c. It is covered with jungles formed of acacia, cotton, bamboos, &c., much of it lying waste and uncultivated. The western tract is all under cultivation. Rice and wheat are extensively grown; jute, jowari, bajra, Indian corn, rape and pulse are the other crops raised. Mulberry and mangoes are two other products from which the people derive a large income. The country is almost of a monotonous level, having no hills anywhere. It is generally open and unencumbered with dense, or deep, or extensive jungles. Rank vegetation, an ever damp soil, under a cheerless shade, nights aglow with glow-worms and an atmosphere thrilling with mosquitoes are not characteristic of this district as they are of those situated lower down. The subsoil water rises to within 10 feet of the surface during the rains and quickly falls on their cessation, reaching a level 40 feet below the surface. Along the river bank, only the superb tanks retain any water during the dry season.

The district contains an area of 1,813 square miles, and a population under 9 lakhs, the average density of the population being over 500 to the square mile. The western half is most densely populated; the eastern half very sparsely. Hindus form 52 per cent. of the population, the Mahomedans 46 per cent, and the aborigines, &c., 2 per cent.

The ethnology of Malda is very interesting. Standing between Bengal and Behar, and the submontane-Himalayan region and the country of the Sonthals, Malda possesses a very much mixed population and a hybrid language. Here the more enlightened Bengalis meet with the less enlightened Beharis, the aboriginal Sonthals and the semi-aboriginals—Kochs, Palis and Rajbansis—the descendants of the once powerful hill tribes inhabiting the slopes of the Himalayas. There has been hardly any mixture of blood, for that is not possible in a country like this; there has been a partial mixture of religion, the hill tribes all professing the Hindu religion, and a greater, though not a wholesale mixtures of language. The majority of the people of the district speaking a Bango-Hindusthan dialect with peculiar accents and intonation not very pleasant—rather disagreeable to hear.

Of the economical products of the district, rice, wheat, bajra, jowari, oil-seeds, indigo, fibres, tobacco, pulses, mulberry and mangoes are the principal. The first is the staple crop and the last two are most profitable concerns. Ordinary country vegetables are raised in fair quantity; of these *parbats* and *brinjals* are the best. Fish is plentiful. There is a great variety of it. It can be had throughout the season.

The material condition of the people living in the western half of the district is on the whole comparatively fair. Those living on the eastern half, the aboriginal and semi-aboriginal tribes, scrape a miserable existence from the inhospitable wilderness they have been pushed into.

The people live in huts walled with mat and roofed with thatch: frail structures, lowly situated, standing in the midst of marshes and surrounded by rice fields. Sanitation of course is little cared for. A single piece of cloth—a *dhoti* or a *sari*, is the only covering used. In the towns, of which there are hardly half a dozen, there are pucca brick-built houses, worse than the village huts in their sanitary aspect, inhabited by landholders, shop-keepers and traders.

The physique of the people is extremely poor. They might get enough to fill their stomachs with, but the nutritive value of their food is very low, and their power of digestion and assimilation is very feeble. A quantity of rice and a few grains of pulses are all that they live upon. It is not that the supply in quantity and variety is short and limited, but that the standard of living is so poor, rudimentary and unscientific. The people of course have no taste for luxuries; they even deny themselves the barest necessaries. Fish can be had in abundance, and meat too is procurable, but they do not care for these things. Milk and ghee they cannot afford to pay for. Even mustard oil is become an article too dear to get; it is selling now at twelve annas a seer! The aboriginal and semi-aboriginal tribes seem to live a better life than the majority of the civilized Hindus and Mohamedans. The physique of the Mohamedans is the worst of all. This is due to their habits of living being so inferior. The aboriginal Santals and the semi-aboriginal Kochs, Palis and Rajbansis are seldom seen in a dispensary. The healthiest and fattest babies are to be met with in their families. They live away from civilized society, but in their neatness and cleanliness, the cottages they dwell in would put to shame the wretched hovels, filled with and surrounded by disgustingly shocking nuisances, in which live their civilized brethren, proud of their wealth and circumstances, but pale with sickness and disease.

The people live a fairly easy and contented life, but they are inert and without any ambition in them. They have hardly any amusements among them, and they seldom indulge in any sports. They meet at a few fairs every year, where they enjoy themselves chiefly with religious exercises, and transact business.

The system of communication in the district is still in its primitive stage. There is no railway nor any metalled road. Country carts in dry, and boats in wet weather, are the only conveyances procurable. The system of rivers forms the main road of commerce.

There are eleven thanas in the district with two municipal unions, and only six dispensaries situated widely apart. Except the Sudder Dispensary no other treats in-door patients. The medical wants of the district have not been adequately provided for.

The income of the district is very small, less than three-quarters of a lakh, its only sources being road-cess, pounds and ferries. The income from road-cess is used up for the maintenance of roads, public works and water-supply, and that from pounds and ferries for the maintenance of schools. A mere fraction only has been made available for the support of the dispensaries. The total cost of the six dispensaries last year was Rs. 11,083-15-5. There were treated 30,123 patients; 508 in-door and 29,615 out-door. Of 1,304 operations done 97 belonged to the selected list.

The principal diseases treated in this district are in order of precedence: Fever, skin diseases, affections of the eye, affections of the ear, worms, dysentery, venereal affections, diarrhœa, rheumatic affections, goître, cholera, spleen disease, leprosy and scurvy.

The district does not look, in the face of it, to be so deadly a place as others in the provinces, yet its health last year was the worst of all. The general mortality was unprecedently high, the highest ever recorded. There were in all 41,363 deaths, giving a ratio of 50 7 per mille; against 26,532 deaths, or a ratio of only 33·07 per mille, the average of the past ten years. This appallingly high mortality was due to the wide-spread epidemics of fever and cholera that raged throughout the district during the winter months.

There were 5,124 deaths from cholera, or 6·4 per mille. The mortality was the highest recorded within the last ten years. The average of the last ten years was only 2,203, or a ratio of 2·7 per mille.

The disease is endemic in the district. Cases were reported throughout the year, except in July, when the heaviest rain fell; the mean temperature was 840°F. with a range of only 10, the smallest for the year. From January to August only sporadic cases occurred, the largest number of which were recorded in May, when the first few heavy showers fell. It broke into an epidemic of a virulent type in September when the rains were over, reaching its maximum intensity in November. Its progress was rapid; from only 4 in August, it rose to 178 in September, 1,124 in October, and 2,742 in November. It fell as suddenly as it rose; from 2,742 to 918 in December, and 230 next month when the epidemic subsided, and the disease assumed its ordinary endemic form.

Comparing the meteorological condition of the healthiest (July) with the unhealthiest month (November), it is noticed how they differed materially. In July there was the heaviest rainfall with the highest humidity, and a high temperature with the lowest range. In November there was no rain, and the atmosphere was drier; the temperature was very low, having a very high range. A statement is given showing the meteorological conditions together with the mortality month by month. From this it would appear that as the rainfall began to decrease with the humidity and the temperature to increase with the range, the epidemic went on increasing, showing that its progress depended a good deal, though not entirely, upon climatological conditions. After the terrible cyclone that blew over Bhagalpur in October several dead bodies and carcasses came floating down the Ganges and were left on the churrs all along the western border of the district. The epidemic dates from that very month. There was raging just then a terrible epidemic on the other side of the Ganges too. Here the villages first affected were those bordering on the Ganges; it spread eastwards but stopped before it had reached the banks of the Mahananda. The eastern half of the district escaped with a few sporadic cases only.

Statement showing the meteorological conditions together with the mortality month by month during 1899.

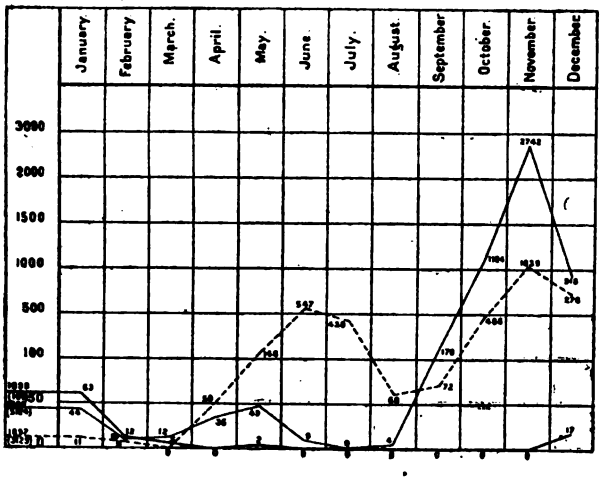
	Rainfall.	Humidity.	Temperature.	Range.	Total mortality.	From fever.	From cholera.
January ...	2·05	59	59·6	22·9	2,938	2,718	44
February ...	0·9	82	66·9	26·0	1,703	1,555	9
March ...	0·05	65	77·1	29·3	1,687	1,526	12
April ...	1·10	70	83·2	25·8	2,258	2,110	35
May ...	3·33	74	87·3	19·5	2,530	2,366	49
June ...	17·51	89	85·0	12·9	1,614	1,469	9
July ...	19·52	92	84·0	10·0	2,117	1,941	0
August ...	12·30	90	84·8	10·2	3,107	2,576	4
September.	6·97	89	84·2	11·4	3,446	3,030	178
October ...	2·13	87	79·4	15·0	6,339	4,891	1,124
November.	0·0	87	69·3	22·4	8,110	5,119	2,742
December..	0·6	92	62·7	23·4	5,504	4,363	918
	65·86	81	77·0		41,363	33,970	5,124

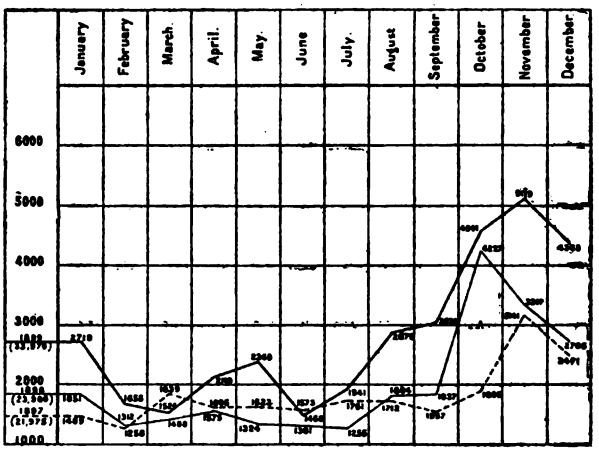
From the chart attached showing the mortality from cholera during the last three years, it would appear that October and November are the worst months and February, March and April the healthiest.

As with cholera so with fever. The mortality recorded under this head last year was the highest ever known. There were 33,990 deaths, giving a ratio of 41·6, against 26,532, or a ratio of 33 07, the average of the last ten years. Fever is endemic. It assumed an epidemic form in October with the cessation of the rain and subsidence of the flood; and with cholera, reached its maximum intensity in November. There was a slight epidemic also in May when the first few heavy showers fell. The healthiest month was June. A chart is attached showing the incidence of death from fever during the last three years. From this it would appear that the epidemic last year was abnormally high. And generally speaking, October and November are the unhealthiest months, and February, March June and July are the healthiest months. The progress upwards of the epidemic last year was quite gradual. There were no fits and starts,

no leaps and bounds as with cholera. The fall too was equally gradual.

That the same meteorological conditions influence the outbreak of both cholera and fever would appear to be correct to a great extent, but that the occurrence of the two diseases does not depend solely upon the same conditions, would be evident when we compare the two charts together and take the figures for 1897 consideration, it would appear that the mortality rises and falls, the fluctuation evidently depending upon climatalogical conditions. How the two stand together, in what intimate relation, it is not easy so to determine. The environments, both external and internal, are constantly changing, and the changes are so difficult to detect. Were all the materials forthcoming, the relation between the two, the causation of diseases, their





only, when the deaths from cholera were as high as those from fever were low.

Comparing the mortality in general with the rainfall during the last ten years, nothing definite can be deduced. On four occasions with a high rainfall there was a high death-rate; on two with a low rainfall there was also a high death-rate; on two occasions again with a high rainfall there was a low death-rate, and on the remaining two occasions with a low fall there was a low death-rate. Death from small-pox is very rare in this district. There were fifteen deaths reported in 1899, twelve in 1898, and only one in 1897. This is one of the best protected districts in the Provinces. The people in general submit to vaccination without a murmur, only the Ferazi Mahomedans forming a small community, object to it on religious grounds. Death from bowel complaints is also small as a rule. Death from injuries is pretty common. Deaths from snake-bite and hydrophobia come under this head. Several such deaths are recorded every year. During the rains when the country is flooded and the villages and busties are turned into so many islands the snakes are driven into them and cause death among the people. Cobras and karaits are the commonest varieties. Deaths from hydrophobia are common. Hydrophobia seems to develop more quickly from a mad jackal bite than from a dog bite. Alligators cause a few deaths every year; they are commonly found in big unclean tanks and *jheels*.

Though the mortality recorded in 1899 was the heaviest, it cannot be said that the general health of the district is growing steadily worse. Taking the figures of the last ten years into progress and termination could be determined almost to a nicety.

To improve the health of a district like this, radical changes need to be effected not only on the surroundings of the man but within the man himself. The marshes are its unhealthiest features. If fever is to be combated with, these should be reclaimed. They should be drained dry and made to grow not rice but wheat, a dry crop and not a wet crop. With the marshes the miasmata will disappear, and with wheat health will appear. The teaching of hygiene should be rigidly enforced and faithfully observed. In a malaria-stricken country rice, as a staple article of food, should be eschewed. The sources of water-supply should be improved and protected and the drinking water invariably boiled. For the disposal of the dead each village and town should be provided with a fixed burial and burning ground. To do away with the night-soil nuisances, field latrines should be laid out—latrines that may be shifted from time to time and the fields brought under cultivation. Lastly, the people should be educated to raise their standard of living. It is not that they cannot afford to live better, but they do not know what better living means and what it is worth. In all these the people must help themselves if they want to be helped.

What has been said of the health of the district of Malda and its medico-topographical features might be said with very little variations of all the other districts in the provinces, and it follows the same measures need be adopted for the improvement of the health of them all.

Review.

The Causation and Prevention of Malarial Fevers.—By Captain S. P. James, M.B. (Lond.), I.M.S. Office of the Superintendent of Government Printing, India. Calcutta, 1903. Second Edition. Price, Re. 1.

Owing to the first edition of 5,000 copies being soon exhausted it has been necessary to issue a second edition of this introduction to the study of malaria. It is an admirably condensed pamphlet of some fifty pages giving a statement of the results of research work, and is primarily intended for the instruction of assistant surgeons, hospital assistants and students. There are eight plates of excellent diagrams and illustrations bearing on the subject-matter.

After dealing briefly with the etiology of malarial fevers, the writer proceeds to describe the general characters of mosquitoes, differentiating very clearly the culex and anopheles types, showing how to mount and examine them, and giving a table of the Indian species of anopheles, followed by remarks on their breeding and habits. Lastly, the characteristics of malarial fevers and their parasites in India, with illustrative charts, the treatment, prophylaxis and prevention of malarial fevers are succinctly dealt with. In the appendix the methods of blood examination are described.

This is a most useful *brochure*, which should materially assist in diffusing a practical knowledge of modern malarial research amongst the rank and file of the subordinate medical department in India, as well as amongst newcomers of the medical profession who have had no previous local experience of the subject

McNally's Elements of Sanitary Science.—Third Edition by Captain J. W. Cornwall, M.A., M.D., I.M.S. Madras Government Press, 1903. Price, Rs. 2-8.

In 1889 Surgeon-Major C. J. McNally, M.D., I.M.S., who was formerly Professor of Hygiene in the Madras Medical College, published his handbook on *The Elements of Sanitary Science*, for the use of district, municipal, local medical and sanitary officers in India. In the Madras Presidency especially the book enjoyed great popularity, and justly so, because it treats of hygiene from an Indian standpoint. But it has been out of print for some time, and Captain J. W. Cornwall, M D., I.M.S., the present Professor of Hygiene and Practical Bacteriology at the Madras Medical College, has conferred a distinct benefit on Indian students by bringing out a new and up-to-date edition, thoroughly revised and partly re-written. In the original work the subjects treated were food, water, air, removal of waste, local conditions, houses, personal hygiene, prevention of disease, microbic diseases, vital statistics and sanitary law. Captain Cornwall has revised all the chapters, with the exception of the Introduction on Health and Disease, without increasing the bulk of the work materially. He has largely re-written the sections dealing with water, the removal of waste, and microbic diseases. The chapter on Sanitary Law refers only to what obtains in the Madras Presidency.

Fungi, Protophyta, and Protozoa.—By G. H. Fink, M.R.C.S., L.S.A. (Lond.).

This is a pamphlet of some forty pages which professes to treat of *Fungi, Protophyta, and Protozoa, their relation to each other, to Helminths, and to Disease, particularly Malarial Fever in the Tropics.* It is written by a retired officer of the Indian Medical Service. What does it all mean? After a careful perusal we have utterly failed to answer this question, and the only conclusion we have come to is that had we not read it we could not have conceived of such a farrago being written *and* printed in the year 1903. It appears to have been printed for private circulation, for it does not seem to have been published in any medical journal, nor does the cover bear any publisher's name, though it has the legend "All Rights Reserved."

Handbook of the Diseases of the Ear.—By Richard Lake, F.R.C.S., Eng., Surgeon, Royal Ear Hospital, etc. Pages X and 232, Illustrations 54 with three coloured plates. Price, 6*s.* nett. Baillière, Tindall and Cox, London.

Students and practitioners have long been waiting for a satisfactory handbook on diseases of the ear, and this work of Mr. Lake's fully supplies the want. The first chapter deals with all the important anatomical points, and is illustrated by a large number of excellent pictures and diagrams of dissections of the ear, and sections through various planes of the mastoid. The succeeding chapters treat of the examination of the patient, the meaning of his symptoms both general and local, general therapeutics and the use of instruments. The estimation of the acuteness of hearing is very well described, and also the various methods of passing the Eustachian catheter.

The external ear takes up one chapter, and three are devoted to the important subject of diseases of the middle ear, which are illustrated by three beautiful plates. Intracranical complications and operations are well and succinctly described; in the latter section is a list of indications for opening the mastoid antrum in cases of chronic suppurative disease which should be most useful; perhaps a little more space might have been devoted to the consideration of the radical mastoid operation.

The remaining chapters deal with malignant disease of the ear; diseases of the internal ear, deafmutism, etc., with a useful note as to the influence ear disease has upon the subject of life assurance.

In short, this book, although not an exhaustive treatise is eminently practical, gives a good working knowledge of the subject and can be thoroughly recommended.

The Practical Details of Cataract Extraction.—By Major H. HERBERT, F.R.C.S., I.M.S. Baillière, Tindall and Cox, London. Crown 8vo. Pp. X and 114. Price 4*s*. Second Edition, 1903.

THE first edition of this most useful special handbook was reviewed at some length in the *Indian Medical Gazette* for April 1903. We have now to welcome a second edition of this eminently handy book on cataract extraction, with all its minutiæ of practical details as to the difficulties to be overcome by the ophthalmic surgeon in this fascinating operation. The new edition rectifies some small errors which had crept into the text of the first issue, amplifies former descriptions, and brings the statistics up to the end of March 1903. Granted the general health is fairly good the essential permissive conditions for operation laid down by the author are that the cataract must be sufficiently ripe, the pupil must react to light, and there must be no inflammation about the eye. Iridectomy is imperative where a chronic cough exists. If profuse intraocular hæmorrhage has occurred while operating on one eye, it is a question as to whether reclination or extraction, after a preliminary iridectomy, is preferable. Advantage may be taken of a preliminary use of calcium chloride and adrenalin. Operation may be impossible in rare cases in which the cataract may be fit for extraction. The author cites such a case with extremely small cornea, and we have seen another in which spasm defeated both cocaine and chloroform anæsthesia, vomiting and failure of respiration complicating he latter.

The author advocates the use of a test-bandage so as to ascertain the condition of the conjunctiva and its secretion, and another essential preliminary is the testing of the patient's self-control and the training of ocular movements. The conjunctival sac is cleansed with 1 in 3,000 perchloride of mercury solution, and ten minutes are allowed for anæsthesia with a 4 per cent. cocaine solution instilled four times at intervals of 2½ minutes. Preference is given for a knife with a very narrow blade, and for toothed iris forceps bent to a right angle and having rounded points.

A very full description is given of the "combined" operation, toilet and after-treatment. Major Herbert bandages only the eye operated on after the "combined" operation, instead of both eyes as is done by many operators, whereas he bandages both eyes after the "simple" operation. This is followed by a dissertation on operative technique, in which the author expresses a very decided preference for perchloride of mercury solution, which he is accustomed to use in the strength of 1 in 3,000, and he remarks that:—"A run of 100 successful operations must be looked on now-a-days as an insufficient recommendation for any particular method, since 1 per cent. of grave infection is exactly 1 per cent. beyond the permissible, and the fate that afflicts us with casualties distributes them by no means evenly."

The "simple" operation does not find as much favour with the author as one might expect, though he does say that those "who have once given it a fair trial appear to be attracted by it more and more without being able to justify their liking on very solid grounds." There are many other grounds, but were it only the after appearance, or "cosmetic effect," we should think that both patient and operator would prefer the operation without iridectomy. Moreover, in apparently suitable cases, it is always possible to convert the "simple" into the "combined" method if any difficulty arises. McKeown's irrigation of the anterior chamber and of the lens-sac for evacuation of cortex is justly recommended as a safe and satisfactory procedure. The operation of extraction without capsulotomy, with or without an iridectomy, is reserved by the author for specially suitable cases in the hands of the average operator, and only as a routine method in specially skilled hands with a large operative experience. A good deal more might have been said on this very attractive if somewhat risky manœuvre.

The exigencies of space do not permit us to follow the author in his excellent chapters on after-complications, and on complicated and soft cataracts. Suffice it to say that this little work on cataract extraction is one which every surgeon coming to India should possess and should study, and it might with advantage be added to the library in every Civil Surgeon's office.

A Practical Text-book of the Diseases of Women.—By A. H. N. LEWERS, M.D., F.R.C.P. Sixth Edition, 116 Illustrations, four coloured plates, pp. 533. Crown 8vo. Price, 10*s*. 6*d*. H. K. Lewis, London.

THIS is one of those excellent text-books belonging to Lewis' practical series, and it has been thoroughly revised to bring this new edition quite up-to-date. The general arrangement of the book differs from that of many text-books on this subject, for the author has aimed at following the order which he considers most convenient clinically. After a good chapter on physical examination and aseptic precautions, diseases of the external parts, vagina, uterus, cervix, tubes and ovaries are dealt with. The text is illustrated by seventy-four cases taken from the practice of the author. The chapter on Bleeding, and its various causes, is full and suggestive. Too much space is given to rupture of the perineum and remedial operations, and Lawson Tait's simple procedure is rather obscured than elucidated by elaborate description and diagrams.

In this, the sixth edition, special attention is directed to fibroid tumours of the cervix as distinguished from uterine fibroids, and the appropriate procedures in each case. The extra-peritoneal treatment of the stump in abdominal hysterectomy has rightly been omitted as obsolete, and too slavish adherence to Keith's drainage is also deprecated with reason, since either no drainage, or a sterilized gauze drain, suffices in many cases.

A Manual of Medicine.—Edited by W. H. Allchin, M.D., F.R.C.P. Vol. V on Diseases of the Digestive System, &c. Macmillan & Co., London, 1903. Extra Crown 8vo, pp. 687. 18 illustrations. Price 10*s*.

The contributors to this volume are Drs. Allchin, Abrahams, Bradford, Bryant, Coupland, Crombie, Dawson, Hebb, Hutchison, Lazarus, Barlow and Hall White. The subjects discussed are diseases of the digestive system, liver, peritoneum, abdominal blood-vessels, kidneys and ductless glands.

The editor's share consists of a clear and concise *résumé* of the normal anatomy of the alimentary canal and physiology of digestion, with a useful table and illustrations. To his pen are also due excellent articles on diseases of the stomach and intestines, of the pancreas, and of the liver in part.

Dr. A. Crombie, formerly of the Indian Medical Service and now Lecturer on Tropical Diseases at the Middlesex Hospital, contributes the articles on sprue, hill diarrhœa and hepatic abscess. There is nothing new or original in any of them, and a perusal leaves the reader dissatisfied that the writer has not drawn more on the rich stores of his clinical experience in India, both as Surgeon-Superintendent to the General Hospital in Calcutta and as Civil Surgeon of Dacca. Instead of this he quotes freely from Rouis and from the Reports of the Sanitary Commissioner with the Government of India. He believes in a microbial origin for both sprue and hill diarrhœa, and suggests that the two *may* be variations of the same disease produced by the same organism under different conditions, though both suggestions must remain in the regions of theory without more positive proofs or facts than we at present possess. There is the same tone of uncertainty or indefiniteness in his remarks on the etiology of liver abscess. "Ghurkhas," "Spiegelian" and "ileum" (for ilium) do not commend themselves in the matter of spelling.

In a work which treats of ulcers of the stomach, small intestine and colon, of enteritis, colitis, diarrhœa, sprue and other intestinal diseases, it seems strange that dysentery should be omitted or relegated to another volume. Another anomaly is to find diseases of the pituitary body in a volume devoted to diseases of the abdominal viscera.

Dr. Hall White contributes a useful article on diseases of the peritoneum, in which he gives a lucid summary of acute general peritonitis, tubercular peritonitis, malignant disease of the peritoneum, subphrenic abscess and retroperitoneal suppuration.

Dr. Bradford is the author of the section on diseases of the kidneys, which he has succeeded in confining to some 87 pages while bringing it up to date. In discussing the etiology of renal disease this is apparent in the portion devoted to toxic substances. The classification adopted in his view of the pathology of the kidneys is a fairly clear and simple one, and is refreshing in comparison with the bewildering muddle that both pathologists and physicians are apt to land themselves in when writing or teaching on this subject. Another pleasing feature is the division of the symptomatology of renal disease into general and special.

With this fifth volume apparently the series is completed. The first two were concerned with general diseases, the third dealt with diseases of the nervous system, the fourth with diseases of the respiratory and circulatory systems, leaving the digestive system, liver, peritoneum and abdominal vessels, diseases of the kidneys and of the ductless glands for the last volume.

Gynæcological Nursing.—By Netta Stewart. Oliver and Boyd, Edinburgh, 1903.

This is an exceedingly practical book on special nursing, written by a nurse for the instruction of nurses, by one who has had ten years' experience as a head nurse in the gynæcological wards of the Royal Infirmary, Edinburgh. Perhaps the best chapter is that which deals with the nurse's duties in cases of abdominal section, and the complications that may arise after various operations pertaining to this category. But every section of the book, from the preparation of the patient for examination, and the preparation of the instruments for an operation, to the special needs of repair of the perinæum or of vesico-vaginal fistula, evince a thorough knowledge of practical detail expressed in a clear and business-like style. It is a manual that might be used with advantage for the practical instruction of Lady Dufferin pupils, nurses and *dais* in India, many of whom are sadly deficient in conscientious adherence to method and to the small details that go far to secure success and peace of mind to the surgeon in India.

A Manual of Pathology.—By Joseph Coats, M.D. Fifth Edition, Revised throughout by L. R. Sutherland, M.B. With 729 illustrations and 2 coloured plates. Price 28*s*. Longmans, Green and Co, London, 1903.

Since the publication in 1883 of the first edition of *Coats' Pathology* the book has been a standard work both for student and practitioner. So conspicuously successful has it been in its various editions that any criticism, discussion or description of it is now superfluous. Dr.

Coats worked and waited long for his professorship in Glasgow University; after quarter of a century of strenuous effort he lived barely five years in the appointment, and part of that time was marred by periods of ill-health. The new pathological institute, chiefly due to his personal endeavour, was under his direction for only three years prior to his death, which occurred in January 1899. The present posthumous edition is intended as a memorial of the respect and esteem in which he was held by colleagues and students, and has been prepared by his late chief assistant, Dr. Sutherland, who is now Professor of Pathology in the University of St. Andrews. The latter has made numerous alterations without materially altering the plan of the original, and he has added some 230 illustrations, mostly taken from specimens in the Pathological Museum of the University College, Dundee.

The chapter on Bacteriology has been omitted from the present volume, since the subject now requires a special treatise. One marked feature in all the editions of this work has been the close alliance of clinical and pathological facts, which makes it doubly interesting and valuable to the average student and practitioner. The same holds good of the present edition. At the end of all the chapters there is appended a copious list of references and authorities germane to the subjects under discussion. This spares the reader's eyes the distraction and unsightliness of endless footnotes. The book is wonderfully complete as regards the range and variety, the fulness, and the most recent knowledge of the subjects treated. It is most liberally illustrated, and its type and "get-up" are fully in accord with the reputation of the publishers.

Squint Occurring in Children.—By E. A. BROWNE, F.R.C.S. (EDIN.); assisted by E. STEVENSON, M.D. Baillière, Tindall and Cox, London, 1904. Crown 8vo, pp. 74, 5 illustrations. Price, 2*s.* 6*d.*

THIS essay is the expansion of an address to the Medical Society of Liverpool, delivered in 1902. It deals with the concomitant convergent squint of childhood, and is based on the observation of cases followed up to adult age. The author does not favour the view of Stromeyer and Dieffenbach that squint is merely a muscular deformity to be treated by tenotomy, by advancement of the external rectus or other modern improvements. No account is taken of the motor nerves. He puts it rather neatly in saying that a boat can be turned by pulling with one oar or by backing water with the other, in either case it turns,—but the steering is not effected by the rudder. In dealing with squint as a muscular deformity to be rectified by the readjustment of tendinous insertions, he considers we are merely dealing effects, however brilliant may be the apparent results, we are not dealing with the true causes. Donders, on the contrary, developed a theory of squint based on the properties of the eye as an optical instrument, which comprises a general statement and the theory proper. The tendency of hypermetropic eyes is to squint inwards and of myopic eyes to squint outwards. There is an intimate association of accommodation with convergence. In the emmetrope they are instinctively maintained for the same point; but the hypermetrope, to see distinctly, must exercise a certain amount of accommodation even for distance, and for a near point he must add the amount that would be required for an emmetrope. Consequently the hypermetrope has a tendency to increased convergence when the accommodation is put on the stretch, so he fixes a given point with one eye and squints double with the other. Adequate correction by lenses is, in the author's view, sounder in theory than surgical interference, though in practice the latter may be the treatment from convenience. He considers the convergent concomitant squint of childhood more as an occurrence connected with a particular period of growth and as part of a faulty and unsymmetrical development of the eyes. The potentiality for this exists in infancy; it may be escaped or it may become periodic; it may become a fixed habit and later permanent, or a secondary periodic stage may be arrived at. As regards the convergence of squint we have to deal with the visual axis alone, and not with the relation of the pupil to the palpebral fissure. The conjugate movements of squinting eyes are performed with the habitual degree of convergence steadily maintained; this convergence is not due to shortening of the internal recti, since the squinting eye can be made to accomplish a separate excursion outwards, restoring the axes *pro tempore* to parallelism.

The failure to accomplish binocular vision is the key for the etiology of squint; it may be due to a pathological cause, such as a nebula, or it may result from faulty growth as in hypermetropic astigmatism. Otherwise all is normal. The muscles are not at fault, convergence is the function of the internal recti effected by the motor centres, but both internal and external recti are innervated at the same time. There is a failure on the part of the peripheral sense-organ to inform its cerebral centres of its requirements, and the convergence-centre is over-exercised in the hypermetrope, consequently hypermetropia specially favours the production of squint, and determines the direction of the visual axis; but hypermetropia is not essential to the overaction of the internal recti. Such is a condensed version of the author's argument, expressed in his own words as far as possible. For his methods of treatment, optical as opposed to surgical, the reader must consult the book itself.

Prescriber's Pharmacopœia.— Kemp & Co. Ld., Bombay, 1904.

IT is now some 14 or 15 years since the first edition of this work was published, and it

has been followed by other editions in 1891, 1896, 1899, and the fifth Edition of this year. This new book contrasts very favourably in both contents and appearance with the second edition of 1891, which we happen to have before us. The latter looks an indifferent imitation of the Martindale and Westcott's Extra Pharmacopœia of the same period. The present issue is something quite different, and has characters of its own that distinguish it from other publications of a similar nature. The changes made in the British Pharmacopœia of 1898 are brought to notice, and the doses are given both in the Imperial and in the Metric systems, and the substances noted in the Indian and Colonial Addendum have been included. A therapeutic index is given at the commencement, and this is followed by the alphabetically arranged prescribers' pharmacopœia, which, in spite of some 1,300 additions, does not appear much increased in bulk. At the end there are notes on urine testing, general testing, analysis of water, poisons and antidotes, weights and measures, thermometry, and lastly a very complete index. This handy little book seems to have fairly established itself as a favourite amongst medical practitioners in India.

A Pocket Dictionary of Hygiene.—Second Edition. By C. T. KINGZETT, F.I.C.; and D. HOMFRAY, B.Sc. Baillière, Tindall and Cox, London, 1904. Price, 2*s.* 6*d.* Pp. 112.

THIS is a very compact little book, $3 \times 4\frac{1}{2}$ inches in size, which contains concise information on a varied and extensive range of subjects related to hygiene, and is intended for the use of Medical and Sanitary Officers. This new edition has several additions, and some of the subjects in the previous issue have been amplified. We imagine the book is more in request amongst sanitary and conservancy inspectors, and perhaps municipal commissioners than amongst graduates in medicine or public health. It should also prove useful to laymen desirous of a smattering of the subject, or to such as require a handy reference in their reading of the daily papers.

EXTRACTS FROM MEDICAL JOURNALS.

DISEASES OF WOMEN AND CHILDREN.

Causes of the Diminished Birth-Rate in France.—The fact that the population of France is not increasing is well known. Pinard and Recehel (*Ann. de gynec. et d'obst.*, Paris, February, 1903) have been investigating the causes which lead to this serious condition of affairs. They state that the marriage-rate in France is no lower than in other countries. The average number of persons in each household is very low. Thus of 1,000 families 171 have no child, 250 have one, 223 have two, 150 have three, 93 have four, 55 have five, 31 have six, and only 27 have seven or more. The figures include only living children; allowing for this, the authors place the proportion of sterile families in France about 13 per cent. The principal cause of the sterility is the after-effects of venereal disease. Checks to conception are also largely employed, and, in part, at least, account for the deplorable results just mentioned.—(*Edinburgh Medical Journal.*)

Treatment of Inflammatory Diseases of Appendages.—Nebesky (*Ztschr. f. Geburtsh. u. Gynak*, Stuttgart, Bd. xliii. S. 43) publishes the results obtained in two years at Munich by the conservative treatment of inflammatory lesions of the appendages. The total number of cases was 360; of those, 120 were severe in type. Most were gonorrhœal in origin. The treatment consisted of absolute rest and good food. In the acute stage, the ice-bag is employed. In the chronic condition douching, hot-air treatment, ichthyol plugs, and finally hot sitz-baths and massage. After three months, marked improvement in the cases was noticed; after six months, in only a few were operative procedures required.—(*Edinburgh Medical Journal.*)

The Administration of Methylene-Blue in Gynæcology and Obstetrics.—Choleix Vivie and Kohler (*Bull. Med. de la Clin.*, St. Vincent, April, 1903), as a result of several experiments, consider that Methylene-Blue is a valuable agent in the treatment of metritis and endometritis. It arrests menorrhagia and metrorrhagia, and frequently stops leucorrhœa. Dysmenorrhœa, due to changes in the mucosa or to uterine anteflexion with cervical stenosis, is also diminished by the exhibition of this body. In gonorrhœal vaginitis, it is also a valuable agent when applied locally. Local application is also indicated in cases of gonorrhœal endocervicitis.—(*Edinburgh Medical Journal.*)

Ovarian Changes in Osteomalacia.—Pestalozza (*Bull. d. sc. Med. de Lille*, January, 1903) describes the condition of the ovaries removed from a patient suffering from osteomalacia. The ovaries were about half their proper size. The patient, nevertheless, was fertile, and menstruation normal in character. On section of the ovaries, a corpus luteum was discovered; it was not at all as large as the usual corpus luteum of pregnancy. According to His, the function of the corpus luteum is to maintain the nutrition of the ovary by means of the active circulation which is present at their periphery. If this view be correct, one is justified in supposing that the deficient development of the corpus luteum was a factor in the atrophy of the ovary in Pestalozza's case.

Osteomalacia is now generally held to be due to excessive morbid activity of the ovaries, and it is of importance that every change which occurs in the ovary should be noted so as to lead to a true understanding as to the pathology of this disease.—(*Edinburgh Medical Journal.*)

Dr. Munro Kerr, of Glasgow, published in the August number of the *Edinburgh Medical Journal* **a case of Chorion Epithelioma (Deciduoma Malignum).**—Case—Mrs. D., a nullipara, æt. 23, was admitted to ward 17, Western Infirmary, on the 17th of May 1902, suffering from pain in the abdomen and hæmorrhage from the uterus. There was a history of a miscarriage in the preceding September. In March she consulted her own doctor, Dr. Graham of Whiteinch. After this, she states that she suffered from pain in the abdomen and constant bleeding. She felt ill, and was often very feverish. On admission to hospital the patient appeared very ill. She was extremely anæmic, had a pulse over 130, and temperature varying from 103° to 105°. On the 23rd of May the uterus was cleared out with the fingers and a curette, and several masses of what was regarded as placental tissue were removed. These were, unfortunately, not preserved for examination microscopically. In the twelve hours following the operation the temperature fell from 106° to nearly normal, but ran up again slightly during the following twenty-four hours. For a month the patient remained fairly well, with the exception of one rather sharp hæmorrhage. The temperature, however, after that time began to show an evening rise, registering 105° on one occasion. Some septic infection was suspected, and intra-uterine douch-

ing was resorted to, but it had little effect. At the end of July I came on duty in the ward, and considering the case one of deciduoma malignum in all probability, I examined the patient under an anæsthetic. I readily got my finger into the uterus, and felt a large rough mass up towards the fundus. Most profuse bleeding now occurred, and indeed, could only be controlled by pulling on the uterus. The patient was extremely collapsed, but I proceeded to remove the uterus, employing ligatures for the broad ligaments. She died on the evening of the operation; indeed she never recovered from the shock, although normal saline solution was transfused.

A *post-mortem* examination was absolutely refused, and therefore it is impossible to say whether metastasis had occurred. A nodule in the vagina was felt, which bled very readily, and it is just possible it was a metastatic growth.

Remarks.—By the time this patient came into my hands, the history of the illness was so clearly that of chorion epithelioma (deciduoma malignum) that there was no difficulty in arriving at such a diagnosis. The appearance of the tumour after removal confirmed that, and, as will be seen from the report by Dr Teacher, microscopically, the growth presented the typical appearance of chorion epithelioma. As regards the operation, I cannot help feeling that, if I had employed clamps as I usually do in this operation, instead of ligatures, for the broad ligaments, I could have removed the uterus much more quickly. The tissue of the broad ligaments was very soft, and the ligatures repeatedly cut through it while I tightened the knots. Had the patient been saved a little more blood, it is possible that the result might have been different. This is all the more to be regretted in this case, because, as far as one could judge, there were no metastases, with the exception of the little nodule in the vagina. The broad ligaments were certainly quite free, and the uterus was quite freely movable No enlarged glands were met during the operation For the pathological investigation of the tumour I have to thank my friend Dr. Teacher.

Prolapse of a Dilated Ureter through the Urethra into the Vulva—E. von Hibler (*Wein Klin Woch.*, April 23, p. 506). A girl, aged 6 weeks, was admitted to hospital for a tumour-like structure which had suddenly appeared in the vulva. She had micturated frequently. The tumour hung from the meatus urinarius by a pedicle It was of the size of a hen's egg and of the shape of a pear with extremely thin walls, and was distended by clear fluid. A cystic tumour, probably arising from an abnormal urogenital duct, was diagnosed. A few hours after admission the cyst ruptured. As the collapsed sac did not return into the urethra and bladder, and was becoming gangrenous, it was cut off with scissors. The general condition was at first good; later pyrexia appeared, and the child died with symptoms of uræmia.

Necropsy.—The cyst was the prolapsed lower end of a dilated ureter of the left kidney, which was atrophied and atresic at its entrance into the bladder. The left kidney was provided with a second patent ureter which entered the bladder normally. The ureter of the right kidney was also extremely dilated. There was hæmorrhagic cystitis which had extended to the two pat nt ureters There were broncho-pneumonia, gastritis, and follicular enteritis. The left kidney was smaller than the right, and its long axis was directed downwards and inwards instead of downwards and outwards. Its upper end was cystic and nodular. The atresic ureter arose directly from the upper cystic part of the kidney without the mediation of a pelvis, and ended blindly about the middle of the trigone. Above the obstruction it had become dilated by the continued secretion of urine from the upper pole of the kidney, and by its weight had become invaginated and had eventually forced itself into the urethra. The second left ureter arose from a well-developed but small pelvis situated at the lower end of the kidney, and after crossing the atresic ureter twice ended normally in the left angle of the trigone. The bladder was dilated and hypertrophied, probably from the pressure of the prolapsed cystic end of the left upper ureter.

In the Innsbruck Museum is a specimen somewhat resembling the condition found in this case. The vesical end of the upper of the two left ureters is obliterated, and the ureter above the obstruction is distended to the size of a walnut. This sac is invaginated into the bladder, but does not reach the urethra. The specimen was obtained from a newly-born child. Caille has published a case of "Prolapse of the Inverted End of the Right Ureter through the Urethra in a child two weeks old" (*American Jour. of Med. Science*, May, 1888). The tumour was mistaken for a prolapsed bladder. No improvement followed an operation, and the child died. There was a double right ureter, which had become prolapsed and formed a spherical sac in the urethra. The urine from the left kidney was passed through the urethra by the side of the prolapse, that of the right escaped directly from the prolapsed ureter.—(*Medical Review, August.*)

J. W. F. R.

ANNUAL REPORTS.

THE SEVENTH ANNUAL REPORT OF THE SANITARY BOARD: THE THIRTY-NINTH ANNUAL REPORT OF THE SANITARY COMMISSIONER: THE THIRTEENTH ANNUAL REPORT OF THE SANITARY ENGINEER; MADRAS, 1902.

THE report of the Sanitary Board occupies exactly one page, and its tenour bears out the concluding sentence:—"The functions of the Sanitary Board in this Presidency are neither administrative nor executive, but merely advisory, and much of the work of the Board consists in scrutinising individual projects in detail."

The cost of staple food-grains was considerably less; it is calculated that a coolie earning a daily average wage of three annas per diem must have saved nearly Rs. 46, as compared with 1901, on the one item of cholam or jowari alone. Apparently the Government of Madras are not inclined to do much to aid the Sanitary Commissioner, Lieut.-Col. W. G. King, I.M.S., in his strenuous efforts to improve the registration statistics of the Presidency. The birth-rate was 28·2 per mille, and the death-rate 20·2 per mille. He has introduced a striking and interesting nosographical map, showing roughly the distribution of malaria, goitre, calculus, beri-beri, elephantiasis, guinea-worm, diarrhœa and dysentery, and typhoid fever.

The following remarks under the heading of cholera are instructive, and they represent what actually takes place still in parts of India where the inhabitants consider themselves as educated and advanced. "In rural areas so late as 12 years back, it was no uncommon matter to find that the total sanitary arrangement made to combat cholera by local authorities was the deputing of vaccinators—who, by some occult reasoning, were regarded as possessed of sanitary or medical abilities, for the purpose of distributing cholera pills. Further back, I remember as special Sanitary Officer of the town of Madras during the epidemic of 1882, finding that disinfection meant distribution of sticks of sulphur to peons, who handed them to the owners of infected houses, who duly burnt them in their verandahs. Nowadays in rural areas Certificated Sanitary Inspectors look to such matters, and slowly—very slowly—synchronously with the dawning belief that sanitation may not deal solely with fads—these men are displacing untrained Conservancy Overseers, or Hospital Assistants who are erroneously expected to medically treat patients, and yet rush from village to village to tend sanitary matters."

Under the heading of Plague Lieut.-Col. King states emphatically his belief that experience in this Presidency shows that man causes the rat to suffer and not the rat man in the first place, that the area over which infected rats roam is usually small, and that recrudescence is by no means a natural feature of the disease, but a very natural result of apathy or too optimistic treatment of an indigenously infected area. Blind belief in this theory of recrudescence, when coupled with the theory of soil contamination, has trammelled all sanitary measures in the past. The application of sanitary measures during decline of the disease in the hot season is of much more value, and the possibility of stamping it out is much greater than usually held. Prolonged vitality of the plague microbe on the soil or its retention of vitality at any material depth, is probably a myth, and, if so, plague policy could be much modified.

Service Notes.

FIRST DRESSING ON THE BATTLEFIELD.

IN the December, 1903, number of the *Journal of the Association of Military Surgeons, U. S. A.*, there is a very interesting paper on this subject by Colonel Nicholas Senn, M.D., Ph.D., LL.D., which was submitted to the military section of the Madrid International Medical Congress. The conclusions of this experienced surgeon are summarised as follows:—

1. The first and most important duty of the military surgeon behind the fighting line is to secure for the wounded protection against wound infection by the early and secure application of the first-aid dressing.
2. Preliminary disinfection of the wound and its environments is not only unnecessary, but harmful.
3. The principles which govern the modern treatment of gunshot wounds were formulated by von Bergmann and Reyher during the Russo-Turkish War, and with very few exceptions remain the same to-day.
4. Military surgery is and always will remain emergency surgery, and for this reason the methods employed in the prevention of wound infection must be made as simple and effective as possible.
5. Absolute asepsis is neither attainable nor essential in protecting a recent gunshot wound against infection.
6. The first-aid package must be made of minimum size and weight, compatible with the purposes for which it is intended.
7. The dressing material of the first aid package must be hygroscopic, and not only aseptic, but antiseptic, and from it must be excluded everything which interferes with the rapid drying of the wound secretion, consequently all impermeable fabric, waxed paper, etc.
8. The antiseptic relied upon must be non-toxic, non-volatile and resistant to chemical changes.
9. The most desirable antiseptic is a combination of boracic and salicylic acid in the proportion of 4 : 1, incorporated in the dressing in powder form, at a point which will correspond with the location of the wound.
10. Every first-aid package should contain, as one of its important component parts, two strips of rubber adhesive plaster, with which to fasten the dressing in place.
11. The dressing material should be connected with the retaining bandage, and the adhesive strips fastened to it, and two pins to the terminal end of the bandage.
12. The gauze roller should take the place of the triangular bandage.
13. A dry crust formed by the desiccated blood and hygroscopic material by which it is absorbed constitutes the most efficient occlusion dressing.
14. For field dressings, hygroscopic cotton is preferable to gauze, as it is a more effective filter, and forms with the infiltrated dry blood a more reliable protective crust.
15. Practically all recent gunshot wounds are aseptic.
16. Post-injury infection must be prevented by bringing nothing in contact with the wound prior to the application of the first aid dressing, consequently no recent gunshot wound should be touched with the finger or probe.
17. In all great wars the number of wounded exceeds the working capacity of the medical officers at the front, and consequently most of the first-aid dressings must be applied by the wounded themselves, their comrades, and non-professional noncombatants.
18. The elastic constrictor has no place in the first-aid package, and should only be used by surgeons, in exceptional cases, as its indiscriminate use would be followed by more harm than benefit.
19. The early removal of the wounded from the firing line to a place of safety is desirable, but is secondary to the importance of the first-aid dressing.
20. The first-aid dressing should be applied as soon as possible, and transportation of the wounded to the rear when it is safest and most practicable.
21. If early transportation of the wounded is attended by too much risk, they should be protected against the fire of the enemy by diminutive earth-works, which can be thrown up quickly, where they should remain until the firing ceases.
22. In case of retreat, the field hospitals should not be moved, and the surgeons and nurses should remain with the wounded.
23. The only instrument which the non-professional should carry on the battlefield is a large, stout pocket-knife. The surgeons engaged in first-aid work should be supplied with a compact operating case, which should contain everything necessary for emergency operations.
24. In the absence of positive indications, the first-aid dressing should not be removed until the wound has healed.
25 The surgeons who apply or inspect the first-aid dressing should, on a tag fastened to the patient's clothing or dressing, notify the hospital surgeons as to the probable conditions of the wound, by classifying them into aseptic and infected wounds, as in so doing the unnecessary change of dressing is guarded against.

THE COMPOSITION OF VARIOUS FIRST-AID PACKAGES.

COLONEL SENN gives the following description of first dressings that have been recommended for use on the battlefield:—

Patin suggested the following first-aid package: One elastic bandage; one antiseptic gauze bandage; two graduated compresses of the same material enclosed first in the paraffin paper, and, as a cover, strong paper made water-proof by linseed oil and a siccator. Bedoin proposed, as a dressing material for first aid, filtering paper sterilized by dry heat and immersion in a 1-1000 bichlorid solution, to which a little glycerin is added, when the paper is slowly dried. Six to eight layers are applied over the wound, besides cotton, and the dressing held in place by a bandage. The package which he recommends for field service contains six sheets of antiseptic filtering paper. 40 centimeters square properly folded; a piece of gutta percha tissue, 45 centimeters square, in which the paper is wrapped; a thin rubber bandage, from 1 to 1·5 meters in length, and several safety-pins. The package weighs 40 grams.

Forgue recommends iodoform and cotton as an exclusive dressing. The first aid package in use in the French army a few years ago is quadrangular in shape, the grey cloth wrapper bearing on one side printed directions for use. It is opened by extracting the thread used in sewing the wrapper. It contains one impermeable fabric; a small cushion of sublimated jute; a sublimated gauze compress and bandage, and two safety-pins.

Von Mosetig-Moorhof advises dusting of the wound with iodoform, over which a gauze compress is applied, then mackintosh or some other impermeable material, which is made to overlap the gauze for at least one inch, and over this a large absorbent dressing and bandage.

Wein recommends iodoform gauze between two layers of absorbent cotton wrapped in gutta percha tissue in a compact package. Before applying the dressing, it is to be immersed in a strong solution of mercuric chlorid, or a carbolized solution, to insure absolute asepticity, when the iodoform gauze is applied next to the wound, and over it the cotton, gutta percha and lastly the retaining bandage.

In 1869 von Esmarch devised the triangular bandage, with printed directions for its use as a component part of the first aid package. His typical first aid dressing consists, besides this bandage, of two compresses of sublimated gauze, 10 centimeters broad, and 100 centimeters long, each wrapped in waxed paper, and an antiseptic bandage, 10 centimeters wide and two meters long. The whole package, in rubber cloth, weighs 100 grams.

According to Seydl, the first-aid dressing in use in the German army in 1893, contained a sublimate gauze bandage 5 meters in length; two compresses of the same material; one safety-pin, the whole wrapped in a compact form in water-proof linen cloth, which is sewed into the skirt of the uniform of officers and men.

In 1891 the following first-aid package was adopted by the English army: Within an outer grey fine linen cover is a thin water-proof cambric inside cover, which is rendered air-tight by being cemented at the edges. Both covers can be readily opened when necessary. The inner cover contains two safety-pins; a piece of water-proof cambric, 12 inches by 6 inches, and this encloses a gauze bandage, 4½ yards long, folded flat into a package, 4 inches by 2½ inches; a piece of gauze, 17 inches by 13 inches, also folded flat, and about 160 grains of compressed flax charpie between two layers of gauze. All the dressing materials are rendered antiseptic by impregnation with mercuric chlorid solution, 1-1000. The weight of the complete dressing is two ounces. This package was in use during the South African War (Makins).

During the Spanish-American War the Surgeon-General issued 270,000 first-aid packages to the troops in Cuba and Porto Rico, and the soldiers in the home camps. Two kinds of packages were used. The one in pale red cover contained two antiseptic compresses of sublimated gauze in oiled paper; one sublimated cambric bandage, with safety-pin; one triangular Esmarch bandage, with safety-pin. Directions printed on package: "Place one of the compresses on the wound, removing the oiled paper. In cases of large wounds, open the compress and cover the whole wound, then use triangular bandage as shown by illustration on the same." The other package, in yellow cover, contained the same materials and directions, but was different in shape, somewhat larger, narrower and thicker.

During the war with Spain, I devised and issued to the Illinois troops 10,000 first-aid packages, which were made up as follows: Two pieces of lintin, a form of compressed cotton, 4 inches wide and 16 inches long, sterilized and folded twice lengthwise; half a drachm of boro-salicylic powder (4 : 1), in a small waxed aseptic paper envelope; between them a piece of sterile gauze, 44 inches square, with two safety-pins, folded to correspond in size with the lintin compress; all of these articles wrapped in tin-foil; 2 strips of rubber adhesive plaster, one inch wide and 8 inches long, the whole sewed in an impermeable canvas or linen cover. One of these packages was sewed into the skirt of the uniform on the left side of each soldier.

All of the first-aid packages which have been described, including those furnished our own army, are too bulky for first aid dressing in the field. The packages used during the Spanish-American War did excellent service in the field hospitals, but

there is no place in the uniform of the soldier where they would be tolerated for any length of time for the purpose for which they are intended.

Kölliker describes one of the simplest dressings for recent gunshot wounds. It consists of an aseptic mull bandage, 5 meters long and 8 centimeters wide, the beginning end of which is impregnated with iodoform, so that this part of the bandage can be folded and used as a compress with which to cover the wound, and the bandage as a fixation bandage. Gutta percha tissue can be included in the bandage with which to cover the compress. The bandage is made up in a package, enclosed in a water-tight cover, and weighs only 15 grams. In applying the bandage, the iodoformized part can be cut off and applied separately over the wound; or it is simply folded over the wound before the roller part is applied.

COLONEL NICHOLAS SENN'S FIRST-AID PACKAGE.

I RECOMMEND the employment of the boro-salicylic powder, 4 : 1, as the antiseptic to be relied upon; a sterile gauze bandage 4 inches wide and two yards in length; a compress of sterile absorbent compressed cotton, four inches by four inches; two safety-pins and a double envelope, the inner of fine paraffin paper, the outer of water-proof linen, upon one side of which the directions for the application are printed; a second similar dressing attached to the first by two loose stitches of sterile cotton threads and two strips of adhesive plaster for each dressing, an inch wide and eight inches long. Half a drachm of boro-salicylic powder is incorporated in the centre of the cotton compress and its location marked on the inner side of the gauze cover with tincture of iodine, the mark corresponding in size with the average opening of an ordinary bullet wound. It is this brown spot which indicates the location of the antiseptic powder, and how and where the compress should be applied. The first cotton compress is rolled once or twice in the beginning end of the gauze bandage, and unfolding prevented by two marginal stitches of aseptic thread. The adhesive plaster strips are fastened to the outer side of the compress, with the free ends covered by the attached cloth reflected over the attached part. The second compress is made up in a similar manner and attached to the first one by two aseptic loose cotton thread stitches. The two compresses are laid against each other with the adhesive strips on opposite sides, and wrapped up neatly in the balance of the bandage, to the distal end of which two safety-pins are fastened. If the package is used in dressing a single wound, both compresses are applied over it with the brown spots in the direction of the wound and the adhesive strips in opposite direction, and the roller bandage applied over them and fastened with the safety-pins. If two wounds are to be dressed, the second compress is separated from the first by tearing the threads connecting them, and applied over the second wound, and both of them fastened with the plaster strips and included in the same roller, or, if the wounds are too far apart, the bandage is cut at the desired point and each part applied separately, in which event the fastening must be done with one safety-pin. In special cases the surplus part of the bandage can be utilized for a sling, or in the application of extemporized fixation dressings. No unnecessary handling of the material is required in the application of this dressing, and the procedure is so simple that the average soldier will comprehend it almost instinctively, and can make intelligent use of it whenever emergency calls for it.

LIEUTENANT-COLONEL C. P. LUKIS, I.M.S., has been granted ten months' furlough combined with privilege leave with effect from the date on which he is relieved of his special duty under the Government of India.

CAPTAIN S. G. BUTLER, R.A.M.C., to be Personal Assistant to the P.M.O., Madras Command, *sub. pro tem.*

LIEUTENANT C. A. GOURLAY, I.M.S., is granted two months' leave on medical certificate.

The undermentioned Lieutenants of the Indian Medical Service, posted to the commands noted against their names, have reported their arrival at Bombay:—

F. N. White, C. G. Seymour, Bengal.
D. Heron, T. C. Rutherfoord, H. C. Keates, E. C. Taylor, Punjab.
R. A. Needham, J. Kirkwood, A. Whitmore, Madras.

CAPTAIN G. E. STEWART, I.M.S., has passed the Higher Standard examination in Pushtu with credit.

THE services of Captain C. Dykes, Supernumerary Medical Officer in Assam, have been placed at the disposal of the Government of India in the Home Department.

CAPTAIN H. S. WOOD, M.B., I.M.S., has been promoted to Major.

COLONEL B. O'BRIEN, M.D., I.M.S., is appointed to officiate as Inspector-General of Civil Hospitals, U. P., during the absence of Colonel C. H. Joubert, M.B., F.R.C.S., I.M.S.

MAJOR P. J. LUMSDEN, I.M.S., is posted as Agency Surgeon in Kotah and Jhalawar.

CAPTAIN W. E. SCOTT-MONCRIEFF, I.M.S., is posted as Agency Surgeon in Haraoti and Tonk.

CAPTAIN C. M. GOODBODY, I.M.S., officiates as Superintendent, Central Prison, Lucknow.

CAPTAIN G. HUTCHESON, I.M.S., on being relieved as Deputy Sanitary Commissioner, 2nd Circle, U. P., is placed on special plague duty, and on being relived of that he will officiate as Civil Surgeon, Banda.

CAPTAIN J. N. WALKER, I.M.S., is placed on special plague duty.

CAPTAIN G. T. BIRDWOOD, I.M.S. Civil Surgeon, Agra to Jaunpur. This has since been cancelled.

THE services of Captain W. G. Liston, M.D., I.M.S., are placed temporarily at the disposal of the Chief Commissioner, C. P.

THE Superintendent of the Mayo Hospital, Calcutta, is appointed to be Inspector of Factories and Certifying Surgeon in the portion of the town of Calcutta North of Canning Street.

SURGEON-GENERAL W. L. GUBBINS, M.V.O., R.A.M.C., to be P. M. O., Bombay Command, *vice* Surgeon-General W. S. M. Price, R.A.M.C.

CAPTAIN R. STEEN, I.M.S., is appointed to have medical charge of the Civil Station of Dinapore in addition to his own duties.

CAPTAIN R. C. LEWIS, R.A.M.C., is appointed to have charge of the civil medical duties of Dum-Dum in addition to his military duties.

CAPTAIN B. G. SETON, I.M.S., is appointed Personal Assistant to the P. M. O., Bengal Command, *vice* Captain J. G. Hulbert, I.M.S.

CAPTAIN J. DAVIDSON, I.M.S., to the medical charge of the 13th Rajputs, *vice* Captain C. H. Bensley, I.M.S.

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will **receive 25 Reprints gratis**, if requested.

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Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscriptions to the Indian Medical Gazette, Rs.* 12, *including postage, in India. Rs.* 14, *including postage abroad.

BOOKS, REPORTS, &c., RECEIVED.

The Nutrition of the Infant. By Ralph Vincent, M.D. Baillière, Tindall and Cox, 1904.

Squint Occurring in Children. By E. A. Browne, F.R.C.S.E; and E. Stevenson, M.D. Baillière, Tindall and Cox, 1904.

Trypanosoma and Trypanosomiasis, with special reference to Surra in the Philippine Islands. By W. E. Musgrave, M.D.; and M. T. Clegg.

First Report of the Trypanosomiasis Expedition to the Senegambia By J. Everett Dutton, M.B.; and J. L. Todd, B.A., M.D; Longmans Green & Co.

Medical Missions in India. Vol. IX. No. 36.

Congenital Dislocation of the Hip, and Lorens's Method of Treating it. Pamphlet by J. Jackson Clarke, M.B., F.R.C.S.

The Practical Study of Malaria. By J. W. W. Stephens, M.D.; and S. R. Christophers, M.B., I.M.S. Longmans, Green & Co., 1903.

A Manual of Medicine, Edited by W. H. Allchin, F.R.C.P., F.R.S.E Vol. V, 1903. Macmillan & Co., London.

Report on the Political Administration of the Territories within the Central India Agency for 1902-1903. By the Hon'ble C. S. Bayley, C.S.I.

ACKNOWLEDGMENTS, COMMUNICATIONS RECEIVED.

Col. K. McLeod, M.D., I.M.S. (Retd.), London; Major F. P. Maynard, I.M.S., Darjeeling; Mr. Arthur Powell, Bombay; Capt. M. O. Thurston, I.M.S., Calcutta; B. L. Majumdar, L.M.S., Calcutta; Capt. C. Barry, I.M.S., Maymyo; Capt. R. F. Standage, I.M.S, Bangalore; Major C. N. C. Wimberley, I.M.S., Fort Lockhart; S. Mallanal, M.D., Hyderabad; Capt. W. H. Cox, I.M.S., Bagdad; Editor, "Medical Review," London; W. R. Thatte, Satara; Capt. H. Gidney, I.M.S., Loralai; Lt. Col. J. L. Van Geyzel, I.M.S., Madras; H. Sen, M.B., Motihari; Capt. T. Stodart, I.M.S., Akyab; Dr. Peypers, Editor, "Janus," Amsterdam; Fridolin Greiner, Neuhaus am Rennweg.

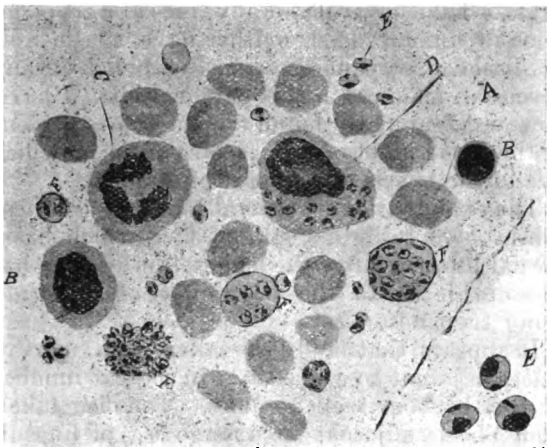
Original Articles.

A SHORT NOTE ON THE PARASITE OF KALA-AZAR.

BY CHAS. A. BENTLEY, M.B,

Medical Officer, Empire of India and Ceylon Tea Co., Tezpur, Assam.

A.—R. B. Corspuscles.
B.—Large Lymphocytes.
B'—Small ditto.
C.—Polyneuclear Leucocytes.
D.—Large Mononuclear Leucocyte containing Parasite.
E.—Free Parasites.
F.—Bodies containing Parasite.



Splenic Blood Film from Kala-azar showing Parasitic bodies, magnified about 1,200 diamaters.

Free Parasites magnified about 2,500 diamaters.

IN the accompanying drawing, I have endeavoured to give a fair idea of the appearance of the parasitic bodies which I have found in the spleen of all cases of *kala-azar* that I have been able to examine during the last few months.

In March 1903 I found small amœboid bodies in the fresh spleen juice of a case of *kala-azar*, and subsequently in smears obtained *post-mortem* and stained, I found numerous small bodies which I now recognise as the same parasites as those described in this article.

Improved technique, and the use of films prepared from splenic blood drawn *inter vitam*, shows these bodies most distinctly to be parasitic organisms.

Last year an unexpected increase in my ordinary duties prevented me from pushing my investigations further, but recently, stimulated by the communications of Majors Leishman, Donovan and Ross, I have made a number of preparations, which show what I believe to be the parasite causing *kala-azar*, and which appear to prove that the chronic fevers with enlarged spleen and liver, the so-called "malarial cachexia" of Bengal and Madras, are identical with the famous *kala-azar* of Assam.

In May of last year Major Leishman described the bodies found by him as far back as 1900 in cases of Dum Dum fever, and more recently Major Donovan has shown that similar parasite are to be demonstrated in blood drawn from the spleen of "chronic malarial (?)" cases in Madras. The finding of similar organisms in cases of *kala-azar* adds still more to the interest and importance of the discovery.

The parasite may be found either in spleen smears obtained *post-mortem*, or in films prepared from blood drawn from the spleen during life by means of a sterilized hypodermic syringe. I have obtained the best results by staining specimens with Grubler's modified Romanowski's stain. This stain, which is of the single-fluid type, is a solution in absolute alcohol, and the application of a drop of it serves to fix the specimen. The subsequent addition of a drop of ordinary water, and its admixture with the still liquid stain upon the film, causes a reaction, during which differential staining takes place. If the slides are washed after waiting for a minute or so, most beautiful specimens can be obtained, without the slightest precipitation of stain upon the films.

Stained in this way the parasite may be easily distinguished as a clearly defined oval body of a bluish mauve tint, containing a larger oval and a smaller rod-shaped mass of deeply crimson-stained chromatin. The smaller chromatin body stains the more deeply.

The parasite occurs free among the spleen cells, singly or in groups, but it may also be found in distinctly defined round cells varying in size between about 5 m/mm. to 10 or 12 m/mm. These cells stain a pale mauve colour, and contain from two to a dozen of the parasites. Many parasites may also be observed lying within the protoplasm of the large mono-nuclear and transitional leucocytes. Frequently large masses may be noted, composed of several hundred of the free parasites, but these should not be confused with collections of blood plates, which may often be observed in the same specimen.

Roughly speaking, the parasite may be said to measure 2 to 3 m/mm. in the long axis, and 1½ to 2 m/mm. in breadth. The size, however, appears to vary with the thickness of the film. In thin films the bodies appear almost round, while in thicker films they assume an oval or even a fusiform shape.

So far I cannot say that I have recognized many intra-corpuscular forms, unless the round cells mentioned above are altered blood cells. I have, however, sometimes found isolated endo-corpuscular bodies in blood films from the peripheral circulation, and I have frequently observed what I believe may have been free forms. Their recognition is very difficult and uncertain however, and examination of the peripheral blood cannot be relied upon for purposes of diagnosis.

Laveran has already pronounced these bodies to be a species of pyrosoma, but the correctness of this statement has yet to be demonstrated.

One fact, however, which appears to give some support to this idea, is the frequent occurrence of outbreaks of cattle disease contemporaneously with epidemics of *kala-azar*.

Recently an intelligent native, who left his village in Mangaldai after losing many relations from *kalaazar*, assured me that cattle disease broke out at the same time as the epidemic attacked his village, and that he and many others had lost relations and cattle, year after year, until the survivors feared to remain in that part of the country.

When questioned as to the symptoms of the cattle disease, he volunteered the statement that bloody urine was passed by a number of the affected animals.

A new coolie from Midnapur district, who came from his country suffering from an enormously enlarged spleen, gave, when questioned, a similar story.

He stated that many people in his village were now suffering from spleen and fever, and that he had lost two brothers from this cause only last year. Cattle disease had broken out, some two or three years before, at the same time as the outbreak of "spleen fever" among the people.

When questioned as to the symptoms shown by the affected cattle, he at once referred to bloody urine as being of frequent occurrence. He said this without being asked leading questions, using the word for blood, and not merely stating that the urine was red.

These statements are of interest when taken in connection with the article on "Red Water in Cattle" by Stewart Stockman, Esq., C.V.D. (*I. M. G.*, Aug. 1903), and Laveran's pronouncement regarding the nature of the parasite found in cases of "spleen fever" by Major Donovan.

Should Laveran's theory prove correct, the spread of *kala-azar* and kindred diseases will probably be found to be due to the bite of some blood-sucking insect, such as a species of tick, or perhaps lice, fleas, or bugs.

There is also the possibility of the disease having been originally conveyed from cattle to man through the instrumentality of cattle ticks, for it is well-known that in many parts of India the people are accustomed to stable their cattle beneath the same roof or adjacent to their own houses, and enquiry will often elicitate the statement that people who live thus in close proximity to their domestic animals are frequently attacked by the ticks which fall from these beasts.

It will be seen at once that the discovery recorded in this article disposes once and for all of the Malta fever theory of the causation of *kala-azar*, although of course it does not necessarily negative the occurrence of this former disease in Assam.

It is hardly necessary to refer to the malarial theory of the etiology of *kala-azar*, because this has been abandoned as no longer tenable by all competent authorities.

I may, however, record the fact that the examination of considerably over twelve hundred blood films from cases of this disease has resulted in the finding of malarial parasites in less than fifty.

Among those showing malarial parasites, Quartan, Benign Tertian and Malignant Tertian in single and mixed infections, have been recorded in about equal proportions.

In spleen smears no malarial parasites have been seen, but old malarial pigment occurred in about half the specimens examined.

In regard to the suggestion that was thrown out at the last British Medical Association Annual Meeting, hinting at a species of trypanosome as the cause of *kala-azar*, I may state that little direct evidence can be brought forward in support of this idea. So far, although I have examined four or five thousand blood films from all kinds of fever cases during the past five years, I have never found any trace of a trypanosome in human blood, neither have I been able to discover trypanosomes in the blood of any species of mammal in this part of India. I have, however, frequently found trypanosomes present in the blood of two species of mud-fish, which live in the bheels of this part of Assam.

The examination of several hundred of these fish brought to light a strange fact, which has a special interest after the suggestion which has been made as to the possibility of *kala-azar* being trypanosomiasis.

It appears that mud-fish taken from marshy places adjacent to coolie lines in a great number of cases harbour trypanosomes. The fish taken from bheels adjacent to a large set of lines in which *kala-azar* had broken out, in nearly every instance were the hosts of this parasite.

Thirty odd fish of this particular species, taken from a bheel adjoining a village which had been attacked by *kala-azar*, showed 100 per cent with trypanosomes. Fish of this kind from other parts of the district, or from other parts of Assam (Gauhati), were entirely free from this parasitic invasion.

What the explanation of this fact may be I cannot suggest, but the existence of diseased fish apparently only in water subject to fæcal contamination, and the occurrence of this disease specially among fish in bheels adjacent to *kala-azar*-infected villages and lines, is a fact which appears to merit further investigation.

ENLARGED PROSTATE.

BY W. J. WANLESS, M.D., *Miraj*.

With special reference to the disease in Indian subjects and the question of choice of operation. With report of six complete Suprapubic Prostatectomies.

(*Continued from page* 48.)

Case No. I.—Waman Rangnath, aged 55, Brahmin, residence Fulthan, 75 miles from Miraj, admitted 15th July 1902.

History and description.—Patient enjoys fair general health, is slightly anæmic, fairly well nourished, heart and lungs normal.

Present trouble began a year prior to admission with burning and frequent micturition,

followed by some incontinence. Was operated on in this hospital for hæmorrhoids a year ago. Trouble increased since then, though relieved of hæmorrhoids.

Admitted complaining of dribbling of urine, frequent micturition attended by burning.

Examination *per rectum* shows prostate to be enlarged, fairly soft, right lobe largest, and whole organ tender to touch. *Searcher* introduced into bladder, the prostate is found moderately projecting into bladder. The urine is normal. Patient put on strychnine and digitalis for four days.

Operation.—19th July. Suprapubic prostatectomy. Chloroform narcosis; time 40 minutes. After irrigation and distension with 12 ounces of Theirsach's solution through a rubber catheter, which was left projecting into the bladder, tied and clamped.

Bladder opened suprapubically through vertical 2½ inch incision. The prostate was found projecting into bladder chiefly in front of the urethra. An assistant with his finger in the rectum pushed up the prostate, the mucous membrane was incised, and the gland removed piecemeal by enucleation with the finger. Hæmorrhage was free, but readily checked by hot boric irrigation and temporary packing with gauze.

A drainage tube was introduced into the wound, and the bladder closed with catgut around it. The skin and fasciæ were closed with silkworm gut except at the lower end, where a light gauze pack was carried down in front of bladder.

A catheter was also passed into the bladder *per urethram*, and left in situ for 48 hours. The drainage tube was connected with a bottle under the bed.

The operation was well borne. The patient was kept on strychnine and sodii salicylas for 10 days following the operation, subsequent to which he was given a simple bitter tonic.

The bladder was washed daily through the tube and the external wound dressed.

The convalescence was uneventful. Healing was complete in 26 days after admission, when the patient was discharged having control over his bladder, and urinating painlessly six to eight times in twenty-four hours. The specimen weighed two ounces.

Case No. II.—Admitted 3rd March 1902. Tatya Narayan, age 55, Maratha, occupation farmer, residence Javaal, 70 miles from Miraj.

History and description.—Good general health. Heart, lungs, and abdominal viscera normal. Has been suffering from three years from frequent micturition; says his urine has never been completely retained until recently; admitted with symptoms exaggerated and micturition attended with burning. Pain in perineum and glans of penis.

Palpation per rectum reveals both lateral lobes enlarged, and by use of a stone searcher a projection into the bladder can be made out. Suffers from occasional partial retention.

Had retention on day after admission and was twice catheterized. Has about an ounce of residual urine.

The urine is normal in reaction and specific gravity. It is slightly turbid and contains triple and earthy phosphates, but no albumen, blood or sugar.

The patient put on 10-grain doses of sodii benzoas and sodii salicylas each four times a day.

Operation.—On March 7th, four days after admission, suprapubic prostatectomy was performed very much as in Case I. The bleeding was more persistent; the bladder was packed with several strips of gauze carried down into the empty prostatic space, and brought out of the external wound in order to control hæmorrhage. The bladder was partly closed around the gauze and the open portion stitched to the skin (mucosa to skin). A drainage tube was carried into the bladder alongside of the gauze. A loose gauze pack was placed in front of the bladder and the skin partly closed. The temperature, which was 100° on the morning preceding the operation, rose to 103°6° on the third day and thereafter gradually subsided. The gauze packing was removed at the end of 24 hours, otherwise the after-treatment was the same as in Case I. By the 23rd of March, 16 days after the operation, the suprapubic wound had closed, and the patient was passing urine *per urethram* without pain and at the intervals of 3 to 5 hours. He was discharged on the 27th day following operation without pain or incontinence. The specimen weighed an ounce and a half.

Case. No. III.—Admitted 9th July, 1902. Imam Mohamad, age 55, residence Kolhapur, occupation pensioned professional wrestler.

History and description.—A large built man, well nourished, organs healthy, good general health. Has suffered for past ten years from frequent micturition, straining, and burning in the neck of the bladder. Has been leading a catheter life for several weeks past in the Kolhapur Hospital; says he has not felt entirely relieved even after the use of catheter. Admitted with bladder distended to umbilicus; examination per rectum shows a greatly enlarged and tender prostate. On passing a catheter urine flows at 12 inches, and the prostate projecting into the bladder can be distinctly made out, while an indistinct grating sensation is conveyed to the hand.

The urine contains blood and mucus, but is otherwise normal.

The patient was catheterized for three days and prepared for operation. An extra long catheter with a long curve was necessary to empty his bladder. The bladder was washed out with Theirsach's solution at each catheterisation and a little of the fluid left in the bladder.

The patient was also put on strychnine and sodii benzoas internally.

Operation.—July 12th. Chloroform narcosis ℥iss, time 1 hour and a half. The bladder was

distended with 20 ounces of hot boric lotion injected through a rubber catheter. The catheter clamped and tied *in situ*. A 3-inch suprapubic vertical incision was made and the bladder opened between ligatures temporarily stitched to the skin. The catheter in the bladder projected through a little below the apex of the projection of the prostate into the bladder. The lateral and middle lobes were symetrically enlarged, forming a cone-shaped projection and a pouch at the base of the bladder. From this pouch 11 stones were removed. The mucous membrane was split over both lateral lobes and the gland shelled out with finger in several pieces, but without injury to the urethra. Bleeding was checked with hot boric lotion and gauze packing, and the subsequent steps of the operation as in Case II.

There was no shock. The after-treatment was the same as in Case II. Urine was passed entirely through the fistula for 60 days, when it began to pass *per urethram*. He left the hospital on the 76th day with a small fistula, from which a few drops of urine escaped. This subsequently closed entirely, it having been cauterized several times to secure closure.

The patient a month after the operation developed an obstinate diarrhœa, which yielded to treatment before he left the hospital. This is a condition which I have observed to develop occasionally in suprapubic operations for stones in old men, where there has been leakage of urine into the cellular tissue around the wound. It is a complication which demands prompt treatment with astringents and opiates and regulation of diet. This patient's convalescence was greatly retarded by this complication.

The patient when he left had control over his bladder and urination was painless, and he voided urine every 3 to 5 hours.

The extirpated gland weighed 2 ounces and 1 drachm. The stones removed were all facetted, the facets in some were worn, smooth and glossy. They consisted of a nucleus of urates and were partly coated with phosphates, and weighed together 3 ounces.

Case No. IV.—Admitted 19th March 1903. Dhanuba Bhivajee, age 70 years, caste Mahr, residence Budhagaon, 6 miles from Miraj.

History and description.—Patient, an emaciated old man, with well-marked senile weakness. Pulse 80, hard and full. Heart, lungs and abdominal viscera normal. Tongue dry and slightly coated. Had "syphilis" 40 years ago.

Patient did not complain of urinary trouble until 10 days before admission when, after drinking freely of sugar-cane juice, he awoke early in the morning and found himself unable to urinate.

After three days' retention he went to a local dispensary and was catheterized, when only "blood" was drawn off. He then went to another dispensary in an adjacent State, where he was given "medicine" only. Since which time until date of admission he had passed only a "few drops of urine occasionally."

Examination showed the bladder reaching two inches above the umbilicus. *Per rectum* the prostate found much enlarged, tender and moderately soft. Was catheterized, catheter reaching the urine at 11 inches, and 40 ounces of urine withdrawn. The urine was clear. 8 to 10 ounces of urine was left in the bladder.

The urine subsequently examined was found to be normal, except that the residual portion was a little turbid. The patient was regularly catheterized thrice daily, and on the fourth day it was found to contain pus, probably due to the carelessness of the house surgeon in sterilizing the catheter. The catheterization was continued, and the bladder daily washed out with warm boric lotion.

The patient was put on strychnine and ergot for the first few days, subsequently on strychnine combined with salicylate and benzoate of soda thrice daily. By the end of another week the urine had cleared up, but the complete retention persisted. The patient was prepared for operation.

March 30th operation.—Chloroform narcosis ℥i, 35 minutes. Preliminary irrigation and distension of the bladder with 25 ounces of Theirsach's solution. The rubber catheter was clamped and tied in, 2¼ inches median suprapubic incision. Bladder opened between ligatures, and the large cone-shaped projection of the prostate into the bladder was felt. The catheter projected from above in front of the enlarged gland, the middle lobe being only slightly enlarged.

The mucous membrane over the gland was incised on both sides, and the enucleation accomplished with the finger without difficulty. Bleeding was free, but readily checked by packing with hot gauze strips; four strips of gauze were packed into the empty prostatic cavity and brought out of the bladder, which was sutured and built up around the rubber tube. Provisional sutures were inserted and were tied when packing was removed after 28 hours. The skin was partly closed and a loose gauze pack placed in front of and above the bladder. The drainage tube was connected with a bottle beneath the bed and sufficed to carry off all the urine until it was removed 15 days after the operation. After this the tube was removed and the urine escaped into the dressing. While the tube was in the bladder it was daily washed with boric lotion. The skin wound healed partly by first intention, and by the 37th day the fistula had externally closed and the patient was passing his urine entirely *per urethram* without difficulty. The patient was kept on tonic doses of strychnine throughout his convalescence, to which the usual urinary antiseptics were added. Specimen weighed one ounce, two drachms and 20 grains.

Case No. V.—Admitted 17th June, 1903. Bhawadin Peerjade, Mohamadan, age 60, occupation teacher, village Masur, 60 miles from Miraj.

History and description.—The patient was admitted to the hospital three years ago suffering from retention of urine. A double vasectomy was done and the patient discharged relieved of his retention symptoms. He continued to urinate without difficulty until five days before admission, when he found himself unable to completely empty his bladder. The symptoms increased until complete retention supervened and he came to the hospital for relief, requesting a radical operation.

The patient was admitted in good general health. Heart, lungs and abdominal viscera normal. Pulse 96, of fair volume. Urine completely retained and bladder distended to umbilicus; 40 ounces of urine drawn off on admission and found to be normal, catheter drew urine at 10 inches. Examination with sound revealed a projection of the prostate into the bladder, and *per rectum* the gland was felt considerably enlarged, moderately soft and tender. Patent put to bed and given strychnine and digitalis for two days.

Operation.—June 20th, ether narcosis ℥vi. Operation, 40 minutes.

The bladder was distended with Theirsach's solution introduced through a rubber catheter, and the catheter tied in. Bladder then opened suprapubically as in Case IV, and the mucous membrane over the gland incised on both sides and shelled out with finger. The enucleation was accomplished with comparative ease, and the gland came away in four pieces. The bleeding was checked with hot gauze and sponges, and after free irrigation with hot salt solution, the bladder was drawn up and partly attached to the skin, gauze pack carried into the empty prostatic cavity at the neck of the bladder. A drainage tube was placed in the bladder, and the remainder of the bladder closed around the catheter and gauze. Two provisional stitches were placed in the bladder at the site of the gauze and tied the next day, when the gauze pack was removed.

The bladder drained satisfactorily and without leakage through the drainage tube, which was connected with a bottle beneath the bed. On the 17th day the tube was removed, the wound having healed without sloughing. The tube was replaced at night, smaller sizes being used from time to time until the 35th day, when it was dispensed with. The patient passed urine *per urethram* on the 39th day and was discharged on August 7th, the 49th day after the operation, passing all his urine *per urethram*, the suprapubic fistula having closed. He had complete control over his bladder. Specimen weighed 2 ounces and 2 drachms.

Case No. VI.—Admitted 18th June 1903. Luxuman Vithoo, age 55, occupation Ramoshi, residence Tasgaon, 12 miles from Miraj.

History and description.—Had "syphilis" 30 years ago, and very little urinary trouble excepting frequent micturition until seven days before admission, when on completing his duty at night he found himself unable to urinate in the morning. He was catheterized in the local dispensary for three days, each catheterization was attended by considerable bleeding.

Patient in good general health. Heart, lungs and abdominal viscera normal. Admitted with bladder greatly distended. Forty ounces of bloody turbid urine were withdrawn, and bleeding was free on introduction of the catheter. Examination *per rectum* and by use of a stone-searcher shows prostate enlarged, moderately hard to the touch and very tender. The urine contains blood, albumen, mucus and considerable amorphous sediment and triple phosphates. The patient was put on sodium salicylate and sodium benzoate, with digitalis and strychnine. He was catheterized thrice daily and the bladder washed out twice. At the patient's urgent request the operation was performed four days after admission; the retention continued complete up to the time of operation.

Operation.—June 23rd, chloroform ℥iss, time one hour. The operation was done as in the last three cases. The mucosa was incised on both sides, but the gland substance being very adherent was enucleated with very great difficulty, and in small fragments. The bleeding was free and was controlled by packing. The gland was hard and fibrous, and the capsule very closely adherent to the gland substance. Shock was considerable but re-action was prompt. The patient did well for some hours, but died suddenly twelve hours after operation during my absence in another village. The nurse said the patient complained of sudden severe pain in his left chest and "frothed freely" at the mouth before death. Death may have been due to pulmonary embolism. No *post mortem* was permitted.

THE BLOOD EXAMINATION OF THREE THOUSAND FOUR HUNDRED CASES OF FEBRILE DISEASE IN BOMBAY.

SEASONAL PREVALENCE OF THE DIFFERENT MALARIA PARASITES.

THE DIAGNOSIS OF THE VARIETY OF THE YOUNG STAINED PARASITES.*

BY MR. ARTHUR POWELL.

(*Continued from page* 45.)

THE DIFFERENTIAL DIAGNOSIS OF THE VARIOUS MALARIAL PARASITES IN THEIR YOUNGER STAGES.

IT is not my intention to recapitulate the differences so obvious in the larger or sporulating stages; these should be known to every novice

* Paper read before the Bombay Medical and Physical Society, since revised and amplified for publication in the *I.M.G.*

in tropical medicine. It is in the younger, especially the ring or merozoite stage, that difficulty is experienced, and our text-books give us little aid.

Most of us can, at a glance, tell whether a horse be Arab, Waler or Country-bred, but few of us would be able to write down the exact points on which we have based our opinion. So with the young malaria parasite. In nine out of ten cases a glance at a single stained specimen suffices to make an accurate diagnosis.

The rule in the Police Hospital is to examine every case after staining by Romanowsky's method. The blood is, if possible, taken during the rigor stage.

The variety of the young parasite is indicated by—

(1) The size.
(2) The colour.
(3) The shape of the blood corpuscle.
(4) The character of the pigment.
(5) The position and shape of the chromatin body.
(6) The shape and size of the parasite.
(7) The relative proportion of the stained protoplasm and the colourless vacuole-like nucleus.
(8) The presence or absence of stippling, or "Schüffner's dots," in the substance of the red cell.
(9) The number of parasites in the corpuscle.
(10) The position of the parasite in the corpuscle.

(1) As regards the size, shape and colour of the blood corpuscle containing the parasite, this remains normal throughout in the quartan. In the benign tertian, from a very early period, the corpuscle enlarges, becomes pale, and is very often distorted in shape, becoming pear-shaped, kite-shaped, or otherwise irregular. In the Romanowsky-stained specimen the drab or greenish colour of the corpuscle is paler than that of the infected corpuscles, and soon shows the stippling of "Schüffner's dots."

In the stained specimen of the malignant tertian the infected corpuscle almost always retains its circular outline, though in the living blood crenation is frequently seen. The stain of the corpuscle is never paler than normal, and may often be much deeper than that of the healthy corpuscles. The corpuscle is not unfrequently diminished in size, in which case the hue is always markedly deeper than normal.

(4) The pigment is not easily observed in stained specimens of benign tertian rings. It is soon evident as coarse black dots in the quartan, and in the middle-aged parasites often takes up a peripheral position, being generally most marked on the opposite side of the parasite to the scattered chromatin.

This appearance is mainly due to the chromatin disguising the contiguous pigment. I may here say that the chief drawback to the use of Romanowsky's stain is the fact that it somewhat obscures the pigment. In the young malignant parasite the pigment is not obvious in the stained specimen. In old rings it is sometimes marked, and then gives the parasite an unmistakably gritty malignant aspect.

(5) *The position and shape of the chromatin body.*—In this we have the most important clue to the variety of parasite. I am not aware that anyone has described this before, though it is so obvious that thousands must have noticed it. In the young quartan the chromatin is placed well inside the periphery; it is at first in one lump, but very soon breaks up into a diffused dust as it were. Even in the youngest spores it will often be seen to consist of about four separate dots. This is well seen in overwashed, or better, in fading specimens.

As the quartan gets older and forms an oblong across the cell, it will be seen that the pigment is well marked along one margin, while the chromatin seems "peppered" along the other. At this stage of quartan parasite the differentiation of the chromatin, karyolymph and cytoplasm is least marked, so that the centre of the parasite sometimes shows only a diffused reddish tinge instead of a sharply defined chromatin spot.

In the benign tertian the chromatin is usually in one round lump situated excentrically, but not on the very edge of the parasite, most frequently close to, or surrounded by, the unstained nucleus or vacuoloid space.

The chromatin of the malignant tertian is very typical. As a rule, instead of forming a little round dot, it is a splash or streak quite on the periphery of the parasite. It has an angular look and may spread a good distance round the circumference. Another occasional appearance of the malignant chromatin is as two small dots which look like the hinges of the common ring-shaped door knocker. This knocker-shaped ring is, in my mind, associated with special malignancy, and is also seen in what I believe is the malignant quotidian parasite.

As regards size, the malignant ring is the smallest. Though the benign tertian spore is smaller than the quartan, it very rapidly outgrows the latter, and is usually seen as quite a large ring.

The proportion of protoplasm staining blue, by Romanowsky's method, is much the largest in proportion to the non-staining centre in the quartan merozoite. It is thin and usually well defined in the malignant. In the benign tertian it is also thin, being thickest opposite the chromatin spot. At this thicker part of the ring the blue shades off gently into the colourless nucleus. The margins of the benign tertian are often less well defined than in the other varieties.

(8) In the very young tertian, as a rule, there is no sign of stippling—"Schüffner's dots." In some specimens, otherwise well stained by Romanowsky's method, no dots may be seen in corpuscles invaded by medium-sized tertian parasites. Though the protoplasm of the latter

is stained a clear blue and the chromatin a bright red. However, the rule is to find Schüffner's dots in all about the very youngest benign tertian corpuscles.

A darker stippling is rarely seen in cells attacked by the malignant tertian parasite, but in these cases the corpuscle is stained throughout of a deeper hue than those not infected.

Cells containing quartan parasites never show stippling. I find I am reported in the transactions of the Nagpur Malaria Conference as saying that "Schüffner's dots" are not diagnostic of benign tertian infection. This is a slip of the pen or tongue. What I wished to convey was the fact that many corpuscles invaded by benign tertian parasites show no dotting even when others from the same patient, stained in the same dish with the same fluid show well-marked Schüffner's dots. The absence of these dots is, therefore, by no means proof that the parasite is not a benign tertian.

On the other hand, we sometimes find a distinct dark stippling—not red "Schüffner's dots"—in cells invaded by malignant rings. Stephens and Christophers say this can be easily observed in slides fixed with chloroform.

(9) I have never recognised two quartan parasites in the same corpuscle; more than one benign tertian parasite is rare, but is occasionally seen. I have seen one anomalous case, in which many of the corpuscles had two or three benign tertian parasites. An appearance as of several benign parasites may very rarely be seen, such as Thayer and Hewetson figure under the name of degenerating or dropsical parasites.

My own impression is that these are parasites which, instead of sporing when full grown, prematurely do so into three, four or six spores.

Multiple infection of the one cell is very common in the case of the malignant parasites.

(10) The position of the parasite. The quartan merozoite at once makes itself comfortable in the middle of the corpuscle. As it grows it is apt in the stained specimen to reach in a narrow line from side to side of the corpuscle, stretching almost quite across it. As it grows older it remains compact, often oval or an elongated quadrilateral, dividing the corpuscle in two.

The benign tertian also does not hang on to the periphery. After passing the ring stage, it is often of an eye form, and later is very irregular in outline. The outline is also not so well defined as in the other parasites, and when the corpuscle is much stippled it is often difficult to say what proportion of the cell is occupied by the parasite, if the specimen be not sufficiently washed after staining.

The malignant ring has a way of hanging on to the edge of the cell, very often looking as if stuck on, rather than inside. Frequently it is only recognisable as a red streak of chromatin along the margin of the corpuscle. This is very characteristic of the malignant ring, and can be seen in almost every moderately infected slide. This appearance may be seen in the benign tertian but only occasionally.

In the *British Medical Journal*, September 19th, 1903, page 645, Christy has written a note on "The Mode of Entry of the Spore into the Red Corpuscle." He bases his theory on having seen in a Romanowsky-stained specimen a large number of parasites spread along the rim of the red corpuscles in the manner I have described as characteristic of the malignant parasite.

If there be anything in his theory, the malignant parasite must take a very much longer period in this process of entry than the other parasites, as we see in almost all heavy infections of the malignant parasite several of the rings hanging on to the rim of the corpuscle, while we seldom see this appearance in benign infections.

This position is in my opinion not characteristic of any stage of the fever. In malignant fevers of well-marked tertian type, I find this peripheral situation as common on the days of intermission as during the fever or sweating stage. I will quote the number of rings apparently projecting from or "splashed" along the periphery, as compared with those completely inside the corpuscle as observed in a case this week—

Monday, T. 102·4°	.	Peripheral	17,	Central	25.
Do. T. 101° (sweating)		Do.	36	Do.	64.
Tuesday, M. T. 98·2°	...	Do.	12	Do.	11.
Do. E. T. 98·4°	...	Do.	19	Do.	17.
Wednesday, T. 103° (sweating)		Do.	16	Do.	20.

This shows that on the day of intermission when the parasites were presumably 24 hours old, the majority still occupied a marginal position, or, according to Dr. Christy, were still in the act of entering the corpuscles.

In the living specimen we do not see this arrangement so marked, and I have been inclined to attribute this appearance to the parasite being more easily moved to the periphery of the corpuscle in the process of spreading the film.

There are undoubted differences in the viscidity of the infected corpuscles. For instance, should the cover-glass be so thick that focussing the microscope disturbs the corpuscles, it will be seen that the uninfected red corpuscles and those containing rings or very young spores run off in the stream caused by the commotion, while the white cells and those containing large quartan or tertian parasites remain stationary.

Here I may give the student a useful hint. Apparently depending on this increased viscidity,—if such it be,—the white corpuscles, as is well known, will be found most numerous at the tail end and on the edge of the dry smear. On the edge of the smear will also be found a greater number of large quartan and benign tertian parasites than in the centre. Therefore, when in search of such parasites, one is likely to find them in this position in the shortest time.

This is a useful hint which I have not seen mentioned by other observers.

Now I have given you this account as a description of *type* parasites. You must not conclude that the types are rigid and unalterable —far from it,—but by paying attention to the points I have mentioned you will be able to decide by seeing what type the majority of the parasites in any given specimen resemble.

You will, however, frequently find malignant parasites which have their chromatin well away from the edge and of a regular globular shape, just as you will often see an Arab horse with a goose-rump and low-set tail. Still, by paying attention to the characters I have indicated, you will make as few mistakes in classifying the parasite as a horse-dealer will in classifying a horse.

The Chairman has asked me to explain the term "Flagellar Fever." This term is the invention of Major A. Buchanan, I.M.S., and I think up to date he monopolises the use of his invention.

In observing untreated the natural course of an infection with the summer-autumn parasite, rings and rings only will be found in the blood for the first few days while the fever lasts. From the end of the fever up to the seventh or eighth day no parasites whatever are observed in the blood. About the seventh or eighth day crescents begin to appear, and at first are slow to flagellate, being sexually immature.

As a rule there is a relapse of the fever about the end of a fortnight from the onset. This fever is accompanied and caused by the presence of rings in the peripheral blood. At this time also the crescents reach their maturity and are therefore quick to flagellate on withdrawing the blood from the body.

Major Buchanan and his assistants observing this flagellation, jumped to the conclusion that the same phenomenon occurred inside the human body. They also failed to observe any rings in the blood. He, therefore, concluded that the fever must be caused by this flagellation, and definitely stated that rings are absent from the peripheral blood at this period of fever.

At the Nagpur Malaria Conference I combatted Major Buchanan's views, as I had always been able to observe rings at the period of secondary fever. I said I was of opinion that either Major Buchanan had overlooked rings in his eagerness to count the proportion of flagellating and non-flagellating gametocytes, or else had met with some exceptional cases in which the rings were few.

I also pointed out that Major Buchanan's observations had been made on living specimens which, up to and during the counting process, must have been outside the human body an appreciable period during which flagellation had time to take place. I pointed out that in specimens dried, and so killed immediately on drawing the blood, showed no flagella, and in my experience, always showed rings during the febrile period, provided quinine were not administered.

On my return I observed a number of cases which fully confirmed my opinion, and wrote out the cases for Major Buchanan's benefit, also sending my remarks as a criticism of his paper on "Flagellar Fever" read at the Conference. He replied he had modified his views and would not publish his original paper in the Transactions of the Conference, whereupon I allowed my criticism also to be withdrawn.

I find, however, he maintains his original theory of intravascular flagellation in the new edition of his book on Malaria, and holds that cases where rings are found during the secondary fever are the exception, and that absence of rings is the rule.

I therefore accept this opportunity afforded me by the Chairman's question to say that I have since observed fourteen cases,—giving no quinine, —and that in all fourteen rings were present in abundance during the secondary fever, and in none were flagella seen in films fixed at once.

I have also corroborated these observations in many cases where, in spite of the administration of quinine, fever has returned at the end of the second week.

There is no doubt, however, that about the end of the second week seems to be the rutting season or spring of the young crescent's fancy, as flagellation is then seen to take place most rapidly after withdrawing the blood. At an earlier period the crescent is immature and unable or slow to flagellate.

INFANT MORTALITY.

BY H. SEN, M.B.,
Offg. Civil Surgeon, Jessore.

THE subject has always been commented upon by sanitarians. It is just now engaging the attention of the highest administrative authority. The general public, however, does not seem to be much concerned about it. They are indifferent, nay, in some countries at least, the matter is looked upon with favour. Every year an enormous number of the new-born is swept away, not by any pestilence breaking suddenly upon them, but by the slow process of a number of diseases which are ever present in the land. High infant mortality has been noticed in every country and clime, but perhaps nowhere it reaches the figure it does in this country. Infant mortality is subservient to an universal law of nature. It is enormous among the lower animals. The higher it goes, the lower the animal stands in the scale of life. It is one of nature's safeguards to keep down the population. It is not diseases only but the animals themselves, even the very parents, which assist nature in her work. The parent cat feeds upon its kittens, the dog upon its pups, the fish upon its eggs. As it is with lower animals so it is with the human being. It is not the savages and semi-civilized people only but the highly-civilized

nations who do away with their offspring in one way or other. Every morning through the streets in the cities of China, carts rattle by collecting dead bodies from the gates as they do dead dogs and cats in the streets of Calcutta. These carts ply under the orders of the local authorities; so the custom there is not only widely prevalent but is one that has been in a way sanctioned by the authorities themselves. In the highly-civilized countries of the West many a baby dies annually under a slow process of starvation through wilful neglect. Even amongst the most highly cultured of them measures are adopted to prevent conception, or when conception has taken place to prevent the birth of a living child. In a word, man himself with his brother creatures of the lower order helps Nature in her work of destruction of the infants. Here I am speaking of physical man. From the point of view of the ethical man, the question appears to assume a different aspect. Nature wants only the fittest to survive. Ethical man wants all to live whether fit or unfit. It is with this view that we are at present concerned. Our object is to ascertain the causes of high mortality among infants with a view to check it. With this view I have lately been collecting facts and figures bearing on the subject. I have been questioning the people as to how the mother and children are treated in child-bed and how infants are brought up. I examined a number of *dhais* who attend on infants at delivery and give them the first dressings. I enquired of village medicine men who pass by the names of ojahs, faquirs and kabirajes, and who treat infantile diseases. As a result of my investigation I have arrived at two facts,—one of which may be a revelation to many. I have collected statistical accounts of 2,067 deaths among infants from different parts of the district, classified according to age and causes of death as noted in the chowkidar's death-notes. The figures classified as to age stand thus :—

Of 2067 deaths 375, or 18·14 per cent., occurred under one day; 214 or 10·35 per cent. under four days; 327 or 15·82 per cent. under 21 days; 232 or 11·23 per cent. under one month; 424 or 20·52 per cent. under six months; 495 or 23·94 per cent. under twelve months.

Age.	Cause of Death.									
	Fever.	Fever with Delirium.	Panchna Panchee.	Cholera.	Drowned.	Burnt to death.	Killed by Jackal.	Other causes.	Total.	Remarks.
One day ..	14	18	256	..	..	..	..	92	375	
One to four days	10	26	181	..	..	..	..	47	214	
Five to twenty days.	20	57	207	..	..	..	..	43	327	
Twenty days to one month.	19	69	118	..	..	..	..	26	232	
One month to six months.	63	242	91	5	...	..	..	23	424	
Six months to one year.	77	369	34	3	1	1	1	9	495	
Total ..	203	776	837	8	1	1	1	240	2,067	

Classified as to diseases 203 or 9·82 per cent. died of "Fever," 776 or 37·54 per cent died of "Fever with Delirium," 837 or 40·50 per cent. died of "Panchna Panchee" *i.e.*, "Nine day fits," 240 or 11·61 per cent. died of "other causes," 8 died of "Cholera," one died of "Drowning," one of "Jackal bite," and one was burnt to death.

Now the principal possible causes of infantile mortality are :—

Atelectasis.
Trismus neonatorum.
Gastro-intestinal catarrh.
Respiratory affections and meningitis.

Deaths from malarious fever, to which the chowkidars attribute 979 or 47·36 per cent. of the deaths, are very rare among infants. It is hardly ever possible among those under one month, and never among those one day old. Yet the chowkidars show 69 such deaths under one month and 57 under 20 days, 26 under four days and 27 under one day,—of the 27 under one day 13 are said to have died of "fever with delirium." Meaning to verify a particular case when I asked a chowkidar what symptoms the child exhibited,—he promptly replied "why the child talked incoherently!"

By "Panchna Panchee" the people mean Trimus Neonatorum,—the literal meaning of the term is "possessed by the devil." While suffering from it the child is said to change colour like a chameleon. It is known to be a very fatal disease. It occurs mostly among children while still in the lying-in room (*atoor ghar*). But several of the cases shown under "Panchna Panchee" cannot possibly be those of tetanus. For out of 817 deaths under this head 251 have been shown among children under one day; a child may catch the disease the very day of its birth, but the disease would take at least two or three days to prove fatal; so these cases under one day cannot come under tetanus. Under the same head 455 shown as having died between one day and one month might be taken as deaths due to tetanus. Again, 21 between six months and twelve months shown under this head must have been deaths due to causes other than tetanus. The large number, namely, 203 *plus* 776 shown as deaths due to "fever" and "fever with delirium," occurring mostly between one month and twelve months, could have been due to nothing else than chronic gastro-intestinal catarrh brought on through malnutrition and exposure. Those above six months among these being especially so disposed, as that is the period of dentition. Some of these deaths might have been due to meningitis, another of the maladies having their origin in improper feeding and insanitary surroundings. Of 375 deaths shown under one day most, if not all, were probably due to atelectasis. It would appear, then, that the chowkidar's classification represents anything but facts. They are grossly false—nay ludicrously so. It is very difficult to arrive at exact facts for more than one reason.

These children are treated and their diseases diagnosed by quacks who recognise only two diseases, "Fever" and "Fits," so all deaths are virtually reported under one or the other of these heads. Some cases seem to defy their powers of diagnosis. The chowkidars have shown 99 cases as due to "Infantile diseases" having no particular name, and 126 have been shown as due to "other causes."

Though thus confronted with more than one difficulty, I will venture to bring the mass of figures I have collected to some order, and endeavour to arrive at the real facts as far as possible under the circumstances. Considering the chowkidars' table from all points of view, and the facts I have been able to elicit by interrogating the people, the kabirajes and others who treat infantile diseases, my classification as to the causes of mortality would stand thus :—

A	B	C	D	E
Mismanagement of labour and diseased parentage.	Malpraxis.	Mal-nutrition—Maltreatment.	In sanitation, &c.	Other causes.
Congenital syphilis, untimely birth, tedious labour, and congenital atelectasis —375 or 18·14 per cent.	Trismus Neonatorum, Erysipelas —773 or 37·40 per cent.	Gastro-intestinal catarrh— 751 or 37·34 per cent.	Meningitis, respiratory affections, Post-natal atelectasis, Diphtheria, Biliary Cirrhosis of liver—156 or 7·54 cent.	12 or ·58 per cent. Details :— Cholera, 8 Drowning, 1 Burns, 1 Wild animals, 1 Malaria fevers 1 Total 12

Under class A I have put in all deaths under one day. I cannot believe infants under one day could die of such diseases as fever and tetanus, under which they have been entered by the chowkidar. These deaths must have been due to other causes; the principal being mismanagement of labour, congenital atelectasis being the immediate cause, immature birth and diseased parentage predisposing towards it. Fruits of child marriage, offspring of undeveloped parents not uncommonly affected with syphilis; handled by ignorant village *dhais* who practise an art most delicate in nature without having the slightest knowledge of it, it is no wonder 18·14 per cent. of the new-born should die at the very entrance-gate of life of atelectasis, the only possible mode of death at the stage.

Under class B I have entered all deaths under one month—the number being 773 or 37·40 per cent. I have put them under malpraxis, because these were deaths due chiefly to Trismus Nascentium, known as 'Nine day fits,' called by the people here 'Panchna Panchee.' When a child is born, the navel cord is cut with a piece of split bamboo, generally without putting any ligature on. The wound is never dressed, any bleeding occurring is stopped with the ashes of burnt rag. The child is washed in cold water, covered with dirty old rags and left on the damp floor in a house having most insanitary surroundings, dark and gloomy, with no proper ventilation; so placed the new-born babe falls the first victim to tetanus, and a few to erysipelas.

Under class C, mal-nutrition and mal-treatment, come 751 or 36·33 per cent. of the deaths. These were deaths under twelve months, the number being the same as given by the chowkidars under fever and fever with delirium. I have not included deaths shown under "Panchna Panchee" and other causes occurring in the same period, namely, under one year, for reasons to be detailed afterwards. I could not accept the chowkidars' diagnosis as to the cause of these deaths. Malarial fever cannot possibly cause such an enormous mortality at this age. These deaths were in my opinion due to chronic gastro-intestinal catarrh brought on by improper feeding and insufficient clothing acting on a naturally weak and delicate constitution.

It is but rarely that a village mother, poor in health, in straitened circumstances, can properly nurse her child; she very often fails and the child has to be fed artificially. The artificial food used by the village people can never be expected to conform to the standard set by nature in the composition of human milk. Uneducated and badly off as the masses are, when the mother fails to nurse, as it happens very often, few families can afford to pay for cow's or goat's milk in sufficient quantities, and none know how to prepare it properly when they get it. As a rule the artificial food consists of a preparation of barley and water boiled together, or of pounded sun-dried rice made into a conjee, or of simple rice-water mixed with a pinch of sugar.* An infant brought up on food like this from the second or third month of its birth can with difficulty struggle through life. He falls an easy and early victim to gastro-intestinal disorders. When a child has fortunately tided over the first four weeks of life, he has got to struggle through a long and continued course of treatment which the unfortunate parents are compelled to adopt for want of means. Exposure with insufficient clothing, privation of food proper in quantity and quality, and grossly insanitary surroundings, easily extinguish the flickering flame. It is only the exceptionally hardy and robust child that can manage to survive a period when things are so much against it.

Under class D I have put in all deaths under one year which have been shown by the chowkidars as due to 'Panchna Panchee' or 'nine day fits,' for this is not the age when tetanus is possible as an infantile disease. These must be cases of respiratory affections such as bronchitis, catarrhal pneumonia bringing on post-natal atelectasis, diphtheria and meningitis, in which affections

* In the intestine of an infant of five months recently operated on I found two lumps of charcoal, a score of large undigested peas, and portions of two varieties of green vegetables.—ED.

symptoms might have been shown at the close akin to those of 'Pachna Panchee,' *i.e.*, 'nine day fits.'

Lastly comes class E under which only the intelligent chowkidar has been able to show diseases which he could not fail to correctly diagnose. The small number 12 or ·58 per cent. of the deaths shown under this head is very significant. Of these eight died of cholera, one of drowning, one was burnt to death, one killed by a jackal, and one died of malarial fever. Evidently among infants few victims are claimed by the ordinary diseases prevalent among the general population.

According to my calculation, then, a large number of our infants, namely, 34·40 per cent. die of malpraxis, by which I mean such diseases as tetanus and erysipelas originating in the mal-practices of the uneducated *dhais;* 36·33 per cent. die of mal-nutrition and mal-treatment resulting in gastro-intestinal catarrh; 18·14 per cent. die of mismanagement of labour which is conducted by accoucheuse totally uninitiated in the mysteries of the art she practises; 7·60 per cent. die of diseases having their origin in insanitary conditions, which are so conspicuously characteristic of our life both rural and urban. Diseases prevalent among the adult population claim only a very few victims. This is quite natural, and I have taken the chowkidars' figures under these heads as correct.

Of the infant mortality then 99 per cent., or to be exact, 99·47 per cent., are due to causes which come under the head of preventible diseases. The remedies lie in the hands partly of the people and partly of the Government. Let Government teach all village *dhais* the art of scientific midwifery. It is a matter of congratulation that the subject has already been thought of, and measures are being taken to carry out the noble proposals of Lady Curzon. All that is now wanted is to give an early effect to them. Thus we may save the life of 53·54 per cent. of our new born infants from deaths due to mismanagement and mal-treatment. Let the general public be educated in the subject of rudimentary hygiene, and let them improve their standard of life, and the remaining causes will cease to operate as well. With all our precautionary measures, however, we are not likely to succeed in keeping down the mortality due to such diseases as meningitis, diphtheria, etc., unless we educate the village practitioners to a certain extent. These men, known by the names of hathuria ojahs, faquirs and boidyas, have different methods of treatment. The hathurias treat cases with all manner of drugs, chiefly vegetable. In the disease known as "shiralotan," meaning "rolling of the head," by which I understand meningitis, a preparation made up of yolk of a black hen's egg, the ashes of *calotropis gigantea* and cinnabar, is applied. A powder made up of mutha (a root), long pepper, athis (*Aconitum heterophyllum*) and "kapuse sirugi," the root of a plant, is given mixed with honey for cases of fever, gastro-intestinal catarrh and respiratory affection. Powdered currie tractus and frankincense, mixed with the juice of the leaves of ægle marmelos, is given for dysentery. The juice of the root bark of the ægle marmelos, sugar and fried paddy mixed together, is given for intestinal disorders.

The ojahs treat the children with "mantra", or incantations, and by mesmeric passage of the hands, throwing water at the same time over the child. The faquirs dole out some earth and flowers for all disorders, with directions to bathe the patients in cold water, etc., etc. Evidently there is need of educating the village doctors, or altogether stopping their work and facilitating that of qualified men among the masses.

Deeply steeped in ignorance and badly circumstanced as they are, immense havoc is caused among the unfortunate people both in the way of infant and adult mortality. Let me give the history of one family living close to the town. I had it from the mother, a Mahomedan woman, 45 years old. She had eight children born to her, of whom only two are now living; of the rest the first, a daughter, died of *cancrum oris* when six years of age; the second, a daughter, died of gastro-intestinal catarrh in the ninth month; the third, a son, died of trismus neonatorum on the 17th day; the fourth, a son died of the same disease on the fourth day; the fifth, a son, died of pernicious malarial fever while five years old; and the sixth, a son, died of æstivo-autumnal fever while 17 years old. So death claimed 75 per cent. of the family before they had reached the age of adolescence; 50 per cent. of the deaths were due to infantile diseases, 33 per cent. being due to malpraxis and 17 per cent. to mal-nutrition; the rest died of malarial affections of the most pernicious type. The history, or rather the record of deaths, of this particular family may be read as that of the people in general, not of this district only, but of the whole Bengal which, as I have said elsewhere, is the real valley of death, and Jessore the bottom of it.

Now, as a further result of my investigation I have, while examining the hath chittas or the death-notes of the chowkidars, discovered a fact which is of supreme importance from the statistician's point of view. It would seem from the statistics given above that out of 2,067 deaths the chowkidars show 979 as due to "fever with delirium" and "fever," which appear in our mortuary returns under the head 'fever,' *i.e.*, malarial fever. Thus while the chowkidars show 47·36 per cent. of deaths under this head I cannot show even one under it. To be true however to the facts, only one case was actually reported as death due to malarious fever with spleen among the 2,067. Again, while scrutinising the death-notes I found several instances in which deaths of persons of from 50 to over 100 years of age have been shown under the ever-

recurrent head of "fever." While I cannot believe that infants die of this much-abused malady, I cannot bring myself to believe that old men and women who have braved all the perils of life for from half a century to a century, and who, I may say, have got naturally immunised (for there is such a thing as natural immunisation following the law of adaptation and self-inoculation) against most of the ailments human flesh is heir to, should fall victims to such a disease as malarial fever. They die of age and not of fever.

But it is with figures such as these supplied by ignorant village chowkidars that our long mortuary returns are prepared. Their notes are taken down blindly by the writer constable. These men are not altogether ignorant or unintelligent, but are very indifferent and careless. They care not to put a question or two to the chowkidars to verify facts. My point is that our statistics are grossly false, nay, ludicrously so, based as they are upon notes furnished by a set of men belonging to the lowest and most ignorant class, and derived from another set of men who, though they doctor the people in the villages, are as much conversant with the nomenclature of diseases and the art of diagnosis as those whom they doctor. When we take into consideration the fact that in our jail the mortality under fever is only 2 *per mille*, and that among the free population is so high as 35 to 50 *per mille*, my point will be clear to all. The fact is that month after month, year after year, we are scattering broadcast our huge statistics heavy laden with terrible and ominous figures under the head 'fever,' 50 per cent. of which are in truth due to mal-nutrition and starvation, privation of food and clothing, and to the presence of grossly insanitary conditions. The majority of the people die of diseases born not of *anopheles* mosquitoes, but of poverty.

I have dilated on this point so much simply with a view to attract the notice of the authorities, and so that steps may be taken at once to check the further flow of these false figures from our statistical department. Highly organised though the department may be, facts manufactured with figures such as these must be as far from truth as the poles are asunder. As to the remedy, nothing can be more simple—give a few lessons to the chowkidars on the parade day as to which of the diseases are to be classed as fever and which not. They all know what cholera, small-pox and dysentery are. Our present mortuary returns recognise only a few diseases, namely, cholera, small-pox, plague, fever, dysentery and diarrhœa, respiratory affection, measles and chicken-pox. It is in distinguishing cases of respiratory affections and chronic bowel-complaints from fever that mistakes are invariably committed. Most if not all "general diseases" characterised with febrile excitement are classed under fever as well; deaths from diabetes, dropsy even, are put under fever. It is not possible to teach the chowkidar the diagnosis of every disease. If they be taught which disease should go under fever they may put the rest under "other diseases" excepting of course cholera, etc., which have got separate headings, and which are easily distinguished.

Whenever I have been in the mofussil, I have made it a point to check the chowkidars' hathchittas, and to give a few lessons to them and the writer constables as well. If measures like these are adopted, we may be able in the course of a few years to produce statistics nearer the truth than they are at present.

A Mirror of Hospital Practice.

A CASE OF HYPERPYREXIA AND DIABETES.

By H. J. WALTON, M.B., F.R.C.S.,
CAPTAIN, I.M.S.

THE patient, a Mussulman of good family and social position, aged 55 years, was apparently in good health up to July 15th. For the preceding fortnight the weather had been excessively and unusually hot. On the afternoon of July 15th I was called to see him. He was quite unconscious, breathing stertorously, with somewhat contracted, equal pupils; the conjunctivæ were slightly congested. The temperature in the axilla was 107·2°F. The pulse was full, 132, and of high tension: no paralysis was detected. The skin of the body generally was dry; there was moderate œdema of the dorsal surface of both feet. The onset of this condition was said to have been quite sudden.

The patient was douched with iced water: in about two hours' time, the temperature had fallen to 102°F., and the man was semi-conscious and very restless. The next morning, the temperature was about normal. The blood was carefully examined, both in fresh and stained specimens; no malarial parasites were found. The urine was also examined: the reaction was acid; the specific gravity 1022; there was no albumen, and the presence of sugar was doubtful.

On the following day, the urine was again examined; the specific gravity was now 1012; no albumen, no sugar. The patient's general condition was much improved; he was perfectly conscious, and complained only of slight headache, dryness of the mouth, much thirst and frequent micturition. The morning temperature was normal, and the evening temperature about 102°F.

For the next three or four days there was steady improvement: the temperature remained normal, and the only fresh complaint made by the patient was of slight annoyance from a

crop of boils on the back and abdomen. During the next few days eight carbuncles appeared: there was a large one behind the left shoulder, and seven smaller ones were upon the buttocks and thighs. Thirst and frequency of micturition continued. The reply given to repeated enquiries on this subject was that these symptoms dated only from the commencement of the present illness.

The urine was now acid; of specific gravity 1022; free from albumen, and contained abundance of sugar: from six to seven pints were passed daily.

On July 25th, the patient declining general anæsthesia, free crucial incisions were made under eucaine in the large carbuncle on the back. There had been a slight evening rise of temperature for a few days previously: after the carbuncle was incised, the temperature remained normal. The slough came away satisfactorily from the large carbuncle: the smaller ones were injected with carbolic acid.

For the next week the patient progressed favourably; his appetite improved, his temperature remained normal, and except slight insomnia, he had no complaints to make. The urine gradually decreased in quantity to about the normal amount.

On August 4th, it was noticed that the patient was a little drowsy: he became slightly delirious and very restless that night. On the following day he showed signs of commencing coma: the breathing became laboured, and the pulse rapid. Transfusion of saline solution was proposed, and was, at first, agreed to by the relatives; however, it was never carried out, as the patient was removed from my care and handed over to a *hakim*. I ascertained that he became more and more comatose, and died three days later.

This case seems to me to be of some interest on account of a possible connection between the hyperpyrexia and the diabetes. It may be that the diabetes was of longer standing, though both the patient himself and his friends were quite sure that the great thirst and polyuria had not existed prior to the hyperpyrexia.

In any case, the coincidence of hyperpyrexia, with possible cerebral damage, and a rapidly fatal attack of diabetes is suggestive.

It is much to be regretted that no *post-mortem* examination could be made.

A CASE OF DOUBLE ABLEPHARON (CONGENITAL).

BY E. H. R. NEWMAN, M.D.,

CAPTAIN, I.M.S.,

Civil Surgeon, Rajshahi.

A HINDOO male child, *æt.* one year, was brought to the Prossonnath Rai Charitable Dispensary at Rampore Boalia on July 24th. The skin from forehead to cheek on both sides was continuous over the orbital cavities. There was no trace or suggestion of a palpebral fissure on either side. The skin was smooth, neither lax nor very tense. The eyebrows were poorly developed, and what existed of them was placed slightly below the upper orbital margin. The nasal bones were poorly developed even for an infant of twelve months, and the face presented an extraordinary mask-like appearance.

The globe of the right eye was more prominent than the left, and the skin and integument over it could be easily pinched into a fold, and seemed to be freely moveable. The skin and integument were somewhat less moveable over the globe on the left side, and to the lower and outer part there was a small fluctuating swelling, which, on examination, was found to be quite local; the fluid in it could not be displaced in the direction of the normally situated conjunctival sac.

The mother stated that the child could distinguish between light and darkness, and I satisfied myself that this was so, though I could not say whether perception of light existed on both sides. She also said that tears ran down the nose when the child cried. I am inclined to doubt this statement, as far as a true lachrymal secretion is concerned.

The orbicularis muscle was evidently fairly developed on both sides. The child was admitted on July 27th, and on the following day I operated on the right side under chloroform. A transverse incision slightly convex downwards was made across the orbital cavity, by pinching up a vertical fold and transfixing it. The incision was then carried well into the inner and outer angles, and the loose areolar tissue, which was found connecting the cornea and integuments, was carefully dissected off the surface of the cornea. A very rudimentary trace of a conjunctival sac was found at the lower and outer part. By carrying on the dissection all over the globe, and suturing the integuments to the margin of the skin incision an attempt at the formation of eyelids was made. The cornea presented an opaque ground-glass appearance, its curvature was irregular and bulging. The normal pearly white appearance of the sclerotic was absent, it was bluish grey in colour, not unlike but still quite distinct from the cornea. No trace of the lachrymal apparatus was found. The results of the operation were very disappointing. In spite of the free dissection, the eyelids, or rather the margins of the skin incision, would not touch or even approximate. The cornea ulcerated and eventually sloughed, and the wound contracted, leaving a granulating sore which had not quite healed when the mother took the child away. No operation was attempted on the left side. I have thought the case worthy of record on account of its extreme rarity. Jules in his work on the eye, the only book I have access to at the moment, speaks of complete ankylo-

blepharon as very rare, and says a small opening usually exists at the inner canthus even in the most complete cases. In this case no eyelids existed at all, and the term "ankylo-blepharon" would be a misnomer; the same objections apply to the term "symblephlaron." I have therefore used,—I do not know if I have coined—the word ablepharon.

A CASE OF KAROBI POISON.

BY J. G. S. FLEMING,
CAPTAIN, I.S.M.D.,
Civil Surgeon, Comilla.

CHANDOO, a Mahomedan female child, aged 2½ years, was found by her father standing near a yellow oleander tree, with a broken fruit in her hand, and part of one seed eaten.

He threw the fruit away and took the child into the house, and gave her a *jalabi* (a native sweet). This was about 7-30 A.M. Immediately after the girl began to vomit, and brought up a part of the seed. The father, now alarmed, ran off to the Comilla Hospital. It was now 8 o'clock. The Civil Hospital Assistant at once referred to karobi poison in Dr. Bedford's recent book on Poisons. He injected hypodermically one-fortieth of a grain of apomorphia, introduced a stomach-pump tube, and washed the stomach out. He then administered coffee, and just before I came at 9 o'clock, a drop of the tincture of aconite.

On my arrival I found the child nervous and timid, the skin bathed in perspiration. Eyes full of tears, conjunctiva injected, pupils normal. Pulse 112, weak. Respiration was hurried. While examining the child she vomited. The vomited matter consisted of coffee grounds, and a small quantity of brown fluid. On admission into hospital, the Civil Hospital Assistant reports the child was crying, and there were convulsive twitches of the hands.

I had to do nothing except continue the administration of coffee. At the end of two hours the child regained quiet. A stimulant mixture was prescribed. The child was discharged from hospital the following morning.

This case is reported on account of its rarity, although the grounds of many native temples, and the gardens of well-to-do natives have the karobi plant growing in them, and as a triumph for Dr. Bedford's little book.

CASE OF RUPTURE OF INTESTINE.

BY H. MARTYN NEWTON, L.R.C.S.E.,
Jalalpur Jattan.

MAHOMED DIN, age 5 years, admitted May 31st.

History.—For three days no motions had been passed, nor was there passage of flatus. Some vomiting (green). Examination showed a distended abdomen, highly tympanitic. No peristaltic movement.

The child was extremely emaciated and collapsed.

Treatment.—Two enemata were given with negative result. Examination per rectum showed the lower bowel to be empty. Operation was then performed, the abdomen being freely opened in the middle line. A small quantity of semi-purulent fluid at once escaped; there was no unpleasant odor. The intestines were congested, and showing the ground-glass appearance of inflammation.

Examination of the small intestine showed no cause of obstruction. The large intestine was then examined. On passing the finger towards the cæcum, there was a rush of flatus and liquid fæces. On drawing the cæcum forwards, a tear, an inch in length, in the circumference of the gut, and opposite the ileo-cæcal valve, was exposed. The margins of the perforation were slightly irregular, and did not show any thinning as of an ulcer. The mesenteric glands were enlarged. The intestine and abdominal cavity were thoroughly washed out with boric lotion. The intestinal wound was stitched with a double row of sutures, and the cavity closed. The child vomited a green fluid before leaving the table; the first since entering hospital. Flatus was passed after closure of the abdomen. Patient died an hour after operation.

Remarks.—No history of trauma of any kind; nor were the signs of peritonitis, or the collapse sufficiently marked to lead one to diagnose a perforation. The peritonitis itself would probably be sufficient to account for the constipation and flatus. No other obstruction could be made out. The child was extremely emaciated, although the edges did not look like those of an ulcer. One wonders if the condition might not have been one of tubercle.

CASE OF MODIFIED TALMA'S OPERATION FOR HEPATIC SCLEROSIS WITH ASCITES.

BY A. NEVE, F.R.C.S.E.

LUSSOO, age about 45 years, had been repeatedly tapped at intervals of six weeks or two months. He was re-admitted on September 23rd, 1903, with his abdomen very greatly distended, and some œdema of the lower part of the abdominal wall. He was not specially debilitated at the time. He expressed his willingness for a somewhat severe operation, with no guarantee of permanent improvement. So on October 9th, I performed the following operation, which differs from that described by Prof. Barker as Talma's method in one important particular.

An incision, central, vertical, four inches long, was made from one inch below the umbilicus

downwards, through the skin only. Retracting the skin on the left side about one inch, an incision was made through the sheath of the rectus, and the fibres of the muscle split parallel to their direction. The peritoneum was not then opened, but was separated with the finger over an area of about four or five inches laterally and longitudinally. It was then incised horizontally at the upper portion. I checked the great rush of fluid with a sponge, and about five minutes was allowed for emptying the abdominal cavity. While still half full, I introduced my hand, and finding that the omentum was retracted and high up, I gently drew it down. A large portion was brought out through the opening in the peritoneum and spread out behind and in contact with the muscles. With fine catgut stitches I attached it to the recesses of this extra-peritoneal pouch. During this time the cavity had drained nearly dry, partly through a medium-sized trocar inserted at the lower end of the wound. The muscles were then sutured with chromic gut, and the skin with silk. The whole operation took twenty minutes, and only two drachms of chloroform were administered. There was slight shock when the fluid first escaped, and this was combatted by a rectal injection of hot water with a teaspoonful of brandy, and by a hypodermic injection of strychnine. He quickly recovered from the anæsthesia, and expressed himself as feeling comfortable.

His progress was free from complications; the temperature never rose above 98°. On the fourth day I found him out of bed, the ward attendant having only left him a minute before. He said that he only got up to urinate. The abdomen filled as rapidly as previously, and to prevent tension on the recent wound I tapped him on the 24th October. On November 12th he was again tapped, and went home on the 17th—thirty-seven days after the operation. Since then he has returned to us and been twice tapped. So up to the present the operation has not effected any cure.

CASE OF PYONEPHROSIS WITH CALCULUS.

KASHMIR MISSION HOSPITAL.

UNDER THE CARE OF A. NEVE, F.R.C.S.E.

A WOMAN aged 30 was admitted on April 4th. 1903, with a history of pain for some months A large hard swelling was felt in the right hypochondriac region, extending downwards to near the crest of the ilium, and forwards to within three inches of the umbilicus. The dulness could be marked off above from the liver. The fever and anæmia of the patient indicated suppuration.

Being sure that adequate adhesions must have formed, an incision was made over the most prominent part, and at no great depth pus was tapped. On exploring, a stone was felt, and withdrawn with narrow bladed forceps. It was not firmly imbedded. It was a black irregular calculus, about the size of a water chestnut.

The wound was drained with a rubber tube 3 inches long, and for the first fortnight the suppuration was free, and the temperature several times went over 102, but later on she made good progress. After a month the temperature remained normal, and there was very little discharge, although a sinus remained. She was dismissed on the 18th of June.

CASE OF LARGE GOITRE; EXCISION THYROIDISM: RECOVERY.

BY E. F. NEVE, F.R.C.S. (EDIN.),

Kashmir Mission Hospital.

FATAH, *æt.* 23, male, was admitted on September 8th, 1903, suffering from a large bronchocele. The tumour, which was the size of a small cocoanut, was on the right side. The isthmus was flattened out and pressing on the trachea. The left lobe was also somewhat enlarged. As a general rule, Kashmiris are well satisfied with the result of the action of the biniodide of mercury ointment, which has a great reputation, and for which they frequently ask. Consequently, unless the goitre is giving considerable discomfort, they decline operative interference. The following day, I removed the tumour with the kind assistance of Dr. H. T. Holland of Quetta. The operation presented no special difficulty, but was tedious and involved the ligature of an enormous number of vessels, although we were working well beyond the limits of the capsule. And the isthmus was broad and very adherent. There was a good deal of unavoidable handling of the tumour mass. After excision I noticed that the cut surface of the isthmus was oozing freely and continued to do so, but the blood was thin and watery. The amount of blood lost was small. This was fortunate, for an hour afterwards, I was urgently summoned to the wards on account of hæmorrhage. On removing the dressings, there was an appalling gush. I opened up the wound and, passing my thumb round immediately above the clavicle, commanded all the vessels and secured a branch of the internal jugular, which had been cut near the main trunk and had retracted. The ligature had apparently slipped off from the strain of vomiting. The patient had lost 15 to 20 ounces of blood in the interval.

He was fairly well till the following day, but began then to get restless, and a troublesome cough set in, and his condition soon became critical. He kept on trying to clear his throat and complained of severe headache. The pulse rate was found to be very high—148, while the temperature was 100 2°. The patient's face was

rather suffused. The dressings were soaked with a thin discharge. The combination of symptoms was unmistakeable, and pointed to thyroid intoxication. The following treatment was adopted. The wound was opened and irrigated, and then carefully stuffed with iodoform gauze. As often as this got moist every few hours, it was removed, the wound again irrigated and fresh gauze inserted. Immediate improvement set in. The patient himself remarked upon the relief experienced every time the wound was dressed. On September 13th, the temperature was normal, the pulse had dropped to 90, and from that time recovery was uninterrupted.

The points of interest about the case are that the symptoms did not at once follow the hæmorrhage and slowly pass off, but that they gradually set in during the 24 hours following the operation, reaching their maximum intensity after 24 hours. The peculiar cough, restlessness, rapid pulse and suffused face, and the copious watery discharge were all, I think, characteristic of thyroidism. The actual poison was, no doubt, in the discharge and probably was derived from the isthmus. Possibly cases with a broad isthmus are more likely to suffer from this complication.

In doing the operation the tumour should be very gently handled and not squeezed, and, if possible, the isthmus should be ligatured *en bloc*. If this is impossible, and oozing is occurring from the surface, it would be wise to sear it with the thermo- or electric cautery.

It is important to recognise thyroid intoxication when it occurs and to treat it promptly, as otherwise it is likely to prove fatal.

ANKYLOSTOMIASIS IN THE PUNJAB.

BY C. H. C. WIMBERLEY, M.B.,
CAPTAIN, I.M.S.,
15th Sikhs, Fort Lockhart.

IN view of recent discoveries as to the widespread distribution of this parasite in England, in Belgium, and in America, as well as in tropical countries, it may be of interest to narrate a case occurring in the Punjab, where, though it may be common, I have not hitherto come across it, or heard of its occurrence.

No. 4292, Sepoy, Kabul Singh, 15th Sikhs, aged 24, a native of the Sirhind District of the Patiala State, and an agriculturist by caste, came to the Regimental Hospital at Peshawar in the middle of May 1903, complaining of breathlessness on exertion. He had never been in any part of India, except at his home, at the Malakand and at Peshawar.

He was a well-built powerful man and looked well-nourished, but presented marked signs of anæmia. He was put on iron and arsenic.

Just after this I left on four months' leave. On my return, in October 1st, I found him in much the same condition, in spite of prolonged treatment. He was fat and flabby like a chlorotic girl, with very pale mucous membranes, and well-marked hæmic murmurs. He said his appetite was very good, and his main complaint was still of dyspnœa on any exertion. On examining his blood, I got the following differential leucocyte count (500 examined) :—

Polymorpho nuclears	63%
Small mono nuclears	23%
Large mono nuclears	8%
Eosinophiles	6%

Finding this marked increase of eosinophiles, I proceeded to examine his stools microscopically, and at the second examination found numbers of small morula-shaped eggs, not bile-stained. Each egg, however, contained some 20 to 30 segments, instead of the 4 or 8 figured in text-books in cases of ankylostomiasis. Perhaps this was due to the fæces not being examined immediately after being passed.

The patient was accordingly starved for 24 hours, and after a purge, ʒi of thymol was given in three doses of 20 grs. at intervals of an hour.

This was followed by a small dose of castor-oil, and in the resulting stool I found numbers of ankylostomes.

I selected four of these for examination, and on placing them under the microscope, all turned out to be males, in which the caudal bursa with its eleven ribs, and the two projecting spicules were beautifully seen.

Unfortunately the patient took his discharge from the service almost immediately after, so I had no opportunity of seeing what improvement in his general condition occurred.

SULPHONAL IDIOSYNCRASY.

BY MILITARY ASST.-SURGEON E. J. MURPHY,
Health Officer, Simla.

ON the 8th January 1904, I was asked by a friend what he should take for a bad headache and restless nights. I suggested a dose of sulphonal; but knowing that he had a diseased heart I told him to take one capsule (B. and W.) 5 grs., to be repeated in an hour's time if necessary.

At night he took two capsules (10 grs.). About half an hour after, his body started itching all over, and he felt extremely warm; though a bitterly cold night he could not bear a blanket on his body, nor could he stand near a small fire in the fireplace.

His hands became œdematous and enormously swollen, the skin of which was intensely red and hot like erysipelas. His feet also were in the same condition, the redness, however, being more marked in parts subject to pressure, *viz.*, the soles, malleoli, and the bend of the ankle where the lace is tied round the boot.

He happened to touch his lips with the back of his inflamed hand; this resulted in a crop of vesicles all over the labial mucous membrane.

The drug also set up a sort of urethritis, and some of the discharge falling on to the scrotum immediately produced a crop of vesicles there.

Remarks.—That the symptoms were due to sulphonal there is no doubt; for after taking the dose, he recalled to mind having suffered similarly on two previous occasions when he took the drug; the symptoms on those occasions, however, being far worse. The whole of the palms of his hands and soles of his feet being entirely blistered, which had to be cut into and treated as ordinary blisters produced by irritants.

The small dose, 10 grs., to bring about such severe symptoms in a healthy adult is remarkable.

What is this pathological action? It cannot be attributed to adulteration or deterioration of the drug. This is the third time with *different* samples that the same results have occurred.

Though most text-books state the drug has no depressant action on the heart, I would venture to think that the ordinary 40-gr. dose would, in this case, have been followed by serious consequences.

The œdema, &c., took three days to subside. No effect on the kidneys was noticed.

I publish this short account in the hopes of others, who have met with similar instances, favouring the profession with their experiences.

PRIMARY CARCINOMA OF THE PANCREAS, WITH UNUSUAL SYMPTOMS.

BY E. F. GORDON TUCKER,

CAPTAIN, I.M.S.

CHINTAMAN RAMCHANDRA, inhabitant of Colaba, a clerk, aged thirty-two, was admitted into my wards at the J. J. Hospital, on October 24th, 1903, complaining of pain and swelling of the abdomen, and great weakness. The distension had come on suddenly twelve days before admission. For nearly one and-a-half months before this he had had a sanguineous discharge from the bowel; this stopped just before the onset of the abdominal distension, and the patient ascribed this distension to the cessation of the flow from the rectum. He was quite clear that the abdominal distension was sudden in its onset, and reached an extreme grade at once.

He was a middle-aged man, extremely thin and with a long narrow chest which contrasted with the broad and protuberant abdomen. The complexion was pale, the conjunctivæ and nails were yellowish. The pulse was soft and regular, and the rate was 96 per minute.

He had evidently suffered from a good deal of abdominal pain, as the abdomen was covered with the marks of the usual native counter-irritants. The chest was long and narrow and the intercostal spaces wide. The respiratory movements were mainly abdominal. Vesicular murmur harsh, otherwise normal.

The heart sounds were feeble throughout, and the apex beat displaced upwards and outwards to the position of the nipple. An anæmic pulmonary bruit was audible.

Urine; quantity 12 oz. in twelve hours, colour a brick red, a plentiful deposit of urates; specific gravity 1020, reaction acid, albumin absent, sugar nil; bile in considerable quantity.

The spleen extended from the upper border of the eighth rib in the mid-axillary line to the lower margin of the ribs in the same line, and anteriorly and inferiorly could be felt two fingers' breadth in front of the left ninth costal cartilage.

The liver dulness commenced at the upper border of the fourth rib, and extended three fingers' breadths below the costal margin in the parasternal line. The surface of the liver was perfectly smooth, and the organ appeared to be very hard. There was fluid between the parietes and the liver, and the phenomenon of "dipping" could therefore be well demonstrated.

Examination of the rectum revealed no stricture within reach, but the anterior wall was bulged backwards from the pressure of the large amount of fluid in the peritoneal cavity.

The appetite was poor and the tongue clean, but the epithelium was absent over a small area on the centre of the dorsum, of the size of a shilling. The teeth were good, and there was no swelling or discoloration of the gums.

There was a small ulcer by the side of the left internal malleolus, from which a guinea-worm was partially protruded.

There was no history of vomiting, nor was there any tenderness in the region of the pylorus, and no tumour could be felt. It was considered to be a case of malarial cirrhosis of the liver with ascites in a subject who had been lately afflicted with dysentery.

Four days after admission, the distension of the abdomen being of such a character that respiration was beginning to be interfered with, I tapped him, and was much surprised to see that the fluid which ran out of the canula was of a bright red colour. It was not pure blood, but was almost so. It was under great tension, but there was no sign of any pulsation as it flowed out. Forty-two ounces were allowed to come away with only slight diminution of the size of the belly. No bad effects from what might be considered a severe venesection were apparent, but I felt it better to stop. The temperature rose the same evening to 102·0. He remained in the same condition for three days. At 8 A.M. on November 1st, he had a severe rigor, lasting fifteen minutes. I found during my morning visit that the abdomen was greatly distended with fluid, and that it was absolutely necessary to relieve this, in spite of the increasing evidence of a profound anæmia. The pulse was very feeble and rapid. Sixty-

one ounces of a similar blood-stained serum were therefore removed. He stated that he felt more comfortable after its removal. The fluid showed no tendency to coagulate,

On the following day it was easier to palpate the enlarged liver; no nodules could be felt. There was an area of tenderness below the ensiform cartilage.

On the following day (November 4th) it was noted that the jaundice had deepened considerably, and the hæmorrhagic tendency was still further emphasised by the appearance of a large ecchymotic patch below the level of the umbilicus on the abdomen of the size of a man's hand.

He was getting large doses of chloride of calcium and turpentine enemata to relieve the distension. The bowels had now become distended with gas, in addition to the distension of the belly with fluid.

The diagnosis that now suggested itself was, either that it was a case of splenic leuchæmia (though the only moderate enlargement of the spleen was against this), or else that it was a case of cancer of the liver with cirrhosis, with ulceration of a cancerous mass into a blood vessel. I therefore determined to draw off all the blood if possible, and if he could stand it, for the purpose of exploring the belly more easily. Examination of a blood film had merely shown that the red corpuscles were somewhat irregular in the matter of size, and that they took the stains badly; in other words, only the usual changes of a secondary anæmia.

One hundred and fifty-two ounces of almost pure blood were therefore removed. The rate of the pulse and the respiration were only slightly increased after the removal of this large amount, and he showed no ill-effects from the operation. The blood showed no sign of clotting after it had been allowed to stand for an hour.

It was now easy to feel the sharp lower margin of the liver, which extended in a crescentic manner across the epigastric angle an inch and-a-half below the costal margin. On the anterior surface there was no sign of nodulation, but on the under-surface of the left lobe one small nodule could be distinctly felt. No lumps could be felt on deep pressure of the belly, but there was an area of tenderness in the abdomen half an inch above the umbilicus and a little to the left.

Two days later there was only a slight amount of fluid in the abdomen, but a hæmorrhage had evidently taken place into the right tunica vaginalis, as the right testicle suddenly swelled up during the night. There was also slight oozing of blood from the site of the last puncture.

On the following day the puncture was still oozing, and there was an indistinct tender mass at the anterior border of the left tensor vaginæ femoris, such as it is common to find in the muscles of patients afflicted with scurvy. The jaundice had become very marked. The ecchymotic patch had now spread all over the surface of the abdomen below the umbilicus.

During the next two days he continued to sink, and he died on the morning of November 10th.

The *post-mortem* examination was made three hours after death, it was necessary to limit the examination to the abdominal organs, and the examination of even these was somewhat hurried.

The abdominal cavity contained about six pints of blood. The pancreas was converted into an enormous hard cancerous mass, which involved mainly the head of the organ, but this had advanced upwards towards the transverse fissure of the liver. The vessels in the free margin of the gastro-hepatic omentum were walled in by the cancer. The portal vein was filled by a large firm white thrombus which extended into the primary branches of the portal veins. Tha gall-bladder was empty and shrunken, and the cystic duct a mere cord, but the right and left biliary ducts, and a portion of the common duct above the cancer, were considerably dilated, having the thickness of a man's little finger. The liver was about two and-a-half times the natural size and was filled with masses of cancer about the size of peas or smaller; here and there were masses of the size of a nut. The whole organ was of a saffron yellow colour on section and the cut surface was very hard. There were no calculi in the common bile duct within the cancerous mass. The glands about the cœliac axis were enlarged and hard. The viscera were pale and the intestines distended with gas. The stomach was considerably dilated, and the mucous membrane very pale, but otherwise it was normal. There were some nodules of cancer of the size of small shot on the serous surface of the bladder in the retro-vesical peritoneal pouch.

The spleen was three times the normal size, hard and pigmented on section, the ordinary "ague-cake."

Sections of a portion of the primary growth showed that the tumour was composed of large polygonal cells, in many of which there were abundant and well-staining neuclei, the latter showing mitotic figures and easily distinguishable networks under a high power. Nuclear-proliferation had evidently greatly exceeded the power of the cell-protoplasm to keep pace with it, and it was undoubtedly a very rapidly growing neoplasm.

The case was therefore one of primary carcinoma of the pancreas, with extensive secondary deposits in the liver, further complicated with thrombosis of the portal vein.

Remarks.—Owing to the depth of the organ within the abdomen behind the peritoneum, and the intimate connection which it has with many organs of the highest importance, diseases of the pancreas, whether tumours, cysts, or

inflammatory conditions, are among the most difficult of all abdominal diseases to diagnose with accuracy. An intense jaundice coming on rather suddenly, and persisting, without any history of previous gall-stone colic, associated with attacks of epigastric pains, and with the presence of a tender area, a localised sense of resistance just above and to the left of the umbilicus, or in rare cases (10 per cent. according to Da Costa) an actual tumour appreciable at this spot, might lead to a correct diagnosis. Osler states that the jaundice is associated with dilatation of the gall-bladder, which may reach a very large size, and that this is a very important point in the diagnosis. This was completely absent in my case, no doubt owing to the pressure of the tumour on the neck of the gall-bladder. The extensive infection of the liver from the primary growth, present in this case, is a matter not noted in any of the books which I have available, and the hepatic enlargement completely masked the pancreatic disease.

In cases of inflammation of the pancreas there are usually, in addition to the localised tenderness, signs of an asthenic peritonitis in those cases not of the fulminant type sometimes seen, and also a localised meteorism. Sometimes also there is thrombosis of some of the mesenteric veins which accentuates the meteorism, and may produce hæmorrhage from the bowel.

There is a form of interstitial inflammation of the pancreas due to syphilis (quite apart from gummatous masses), which it may be impossible to distinguish from carcinoma of the organ even at an exploratory laparotomy. As an instance of this, and as showing the occasional very happy result of anti-syphilitic treatment, I may mention the following case which I saw several years ago when a House Surgeon.

A middle-aged man, a railway guard, came into hospital complaining of intense jaundice, extreme and rapid emaciation, and debility. The motions were merely those of an ordinary case of jaundice. Nothing abnormal could be detected in the abdomen, except some rigidity of the upper portion of the recti muscles. The abdomen was opened, and the surgeon on putting in his hand declared it to be a case of cancer of the head of the pancreas. The wound was sewn up, and as soon as it had healed, and the stitches removed, the patient elected to go out of hospital to die among his friends. There was an indefinite history of syphilis in the case, and a happy thought induced me to send him away with a prescription containing iodide of potassium in large doses. About a month afterwards he returned in apparently excellent health, the jaundice had left him, the bowels were regular and acted naturally; he had increased in weight and strength, and had resumed his work as a railway guard.

As regards the condition of the stools in pancreatic disease, it may be mentioned, as pointed out by Mayo Robson, that we may occasionally find sugar in the urine, or fat in the stools, or fat in the urine, but these occurrences are of great rarity, and their absence cannot be taken as an assistance in the elucidation of the case one way or the other.

CEREBRO-SPINAL MENINGITIS IN AKYAB JAIL.

BY T. STODART, M.B., C.M.,

CAPTAIN, I.M.S.,

Medical Officer and Superintendent of Jail, Akyab.

IN continuation of an account by Captain Barry, I.M.S., in the May issue of your journal of four cases of cerebro-spinal meningitis which occurred in Akyab jail during the autumn of 1902, I append notes of five cases which have occurred since September 1903; no cases had occurred since the last noted in Captain Barry's report which was in December 1902. It seems worthy of note as pointing to a seasonal influence that the outbreaks occurred during the autumn months in both years. I do not think that dust can be blamed as the carrier of the infection. Akyab is never afflicted with dust, and much less so at the end of the rains than at other times of the dry weather.

This year there has been a record rainfall of over 230 inches. Three of the men attacked were engaged in the making of bamboo mats, one was in the cook house, and one was a chronic invalid who had spent most of his time between the hospital and convalescent gang. No special connection could be traced between the several cases except that the three whose dates of attack synchronised most nearly, *viz.*; Nos. 2, 3 and 4, had the opportunity of infecting one another or being infected from the same source, because Nos. 2 and 3 slept in the same ward, and Nos. 3 and 4 worked in the same workshop. Nothing more definite than this could be ascertained.

The symptoms were in all cases fairly typical, and the diagnosis easily established. A prominent feature was the rapid onset with high fever and restless delirium, followed by a period of depression of physical and mental powers. The temperature was mostly of an irregular type, while the pulse and respiration in four of the cases were hardly affected. Obstinate constipation was a feature in all.

With regard to the *post-mortem* changes, in none of the cases was the spinal cord affected. It was remarkable that in case No. 4 nothing abnormal could be found, and this in spite of a prolonged illness with many marked symptoms. The brain looked to me as healthy as any I have ever examined, while the other organs were on a par with it, except that they were somewhat atrophied. In two of the cases the pneumococcus was detected by microscopic examination of the cerebro-spinal fluid.

No.	Name.	Age.	Date of attack.	Date of admission to Jail.	Number of ward	Labour.	Symptoms.	Result.	*Post-mortem.*
1	Mg. Chit ...	44	31-8-03	20-6-03	1	Cook ...	Admitted with temperature of 104°F. Became very restless, tossing limbs about and rolling from side to side. Pain in back of neck with retraction of head later. Pulse kept about 80 throughout the illness, and respiration 28 to 30.	Died 17-9-03.	Whole brain looked anæmic and the convolutions flattened, as if they had been squeezed upon. Much cerebro-spinal fluid, exudation of greenish-yellow lymph over cortex along course of vessels, especially over frontal and occipital lobes. Spinal cord unaffected. Other organs congested. Intestines contained numerous scybalæ. *Microscope:* Pneumococcus.
2	Kyaw Aung	29	1-9-03	29-5-03	3	Bamboo splitting in No. 5 Shed.	Admitted complaining of fever and headache. Restless delirium shortly supervened. Following day speechless and soporific. Later head symptoms lightened. Pain over occiput and spine. Hyperæsthesia general. Marked constipation. On 20th day of illness a fit of clonic convulsions, succeeded by aphasia and paralysis of right arm. Slow convalescence. Paralysis of arm remained partial, as also feebleness of mental powers, and some aphasia up to 30-11-1903. Temperature irregular. Pulse 70 to 90; Resp. 25 to 35.	Recovery.	
3	Thazan Mallak	35	-9-03	30-6-03	3	Bamboo splitting in No. 6 Shed.	Admitted with temperature 103°F. and in active delirium. Tossed violently about the floor of the ward. Quite unconscious. Pupils dilated. Consciousness returned after two days, and much pain all over body. Hyperæsthesia. White exudation in left aqueous chamber of eye. Lapsed into typhoid condition. Marked constipation throughout.	Died 15-11-03.	Engorgement of veins of cortex. Exudation of greenish-yellow lymph in sulci. All organs congested. *Microscope:* No resu
4	Nga Pyaw ...	29	5-9-03	19-3-03	1	Mat-making in No. 6 Shed.	Sudden onset of high fever. Temperature 104°F. and delirium. Pupils dilated. Photophobia; constipation. Consciousness returned on 3rd day, and then he complained of pain all over body, but especially violent headache. Later aphasia developed.		
							On 27th October an attack of hæmoptysis lasting two days. On 30th convulsions of a clonic character. On 14th November hæmorrhage from bowels. On 22nd November another attack of convulsions of a clonic character. This was followed by delirium of a low type. This attack practically finished him, and he sank into a typhoid condition and died on 28-11-03. Temperature very irregular. Pulse 80 to 90; Resp. 20 to 24.	Died 28-11-03.	No abnormality could be detected. The brain and cord were to all appearances normal, as were other organs. Microscopic examination of cerebro-spinal fluid showed nothing.
5	Anor Ali ...	35	6-11-03	8-5-03	Hospital	Convalescent gang.	Was of a debilitated constitution and had been in hospital several times for dysentery. On 6-11-03 his temperature rose to 105°F. Delirium supervened. Complained of pain all over body. Urticarial eruption which passed off within 12 hours. Involuntary evacuations. Alternate periods of consciousness and unconsciousness. Sank in the typhoid condition. Temperature intermittent. Pulse 120; Resp. 28—30. *N.B.*—This man was discharged from jail at the beginning of his illness and was treated and died in the General Hospital.	Died 19-11-03.	Marked injection of the cerebral hemispheres. Effusion of a transparent light greenish-white fluid into sulci over parietal bones. Spine not affected. Other organs congested. *Microscope:* Numerous pneumococci.

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MOVABLE KIDNEY.

ALTHOUGH the condition of movable, floating or dropped kidney has been keenly discussed by physicians and surgeons for the last quarter of a century, yet there are many moot points, concerning which there is quite a remarkable difference of opinion. Some consider the condition of little consequence, and any symptoms connected with it rather as manifestations of a neurasthenic diathesis. Consequently their ideas of treatment are chiefly palliative, being directed to the neurosis and to strengthening the abdominal muscles by massage and faradisation, to attempts at retaining the mobile organ in position by means of belts with crescentic pads or trusses, corsets and binders, and to such obvious general precautions as will tend to prevent sudden descent of the diaphragm, *e.g.*, regulation of the bowels and avoidance of sudden or violent exertion.

Others, on the contrary, with good reason, regard the condition as one deserving of serious attention, requiring in many cases operative measures to anchor the kidney in position. Even those who are agreed on operation differ as to details, whether the incision should be oblique, transverse or vertical, as to the nature of the sutures, whether all or part of the perirenal fat should be removed, whether the capsule of the kidney should be stripped wholly or partially, and whether the sutures should be passed through the capsule alone, the perirenal fat or even the kidney, to be fixed to the lumbar aponeurosis, the dorsal muscles or even hitched on to the twelfth rib.

That medical men should be so much at variance as to the propriety of merely palliative measures, or of nephropexy, is natural enough when we reflect on the gradual evolution of the treatment now generally accepted for many morbid conditions of the abdominal and pelvic organs. At the same time there are certain easily recognised factors for this uncertainty and discrepancy. One is that pain is such a deceptive symptom in abdomino-pelvic conditions, another is that symptoms are slight or absent in some cases of undoubted movable kidney, while they are often severe in neurotic cases, and since the symptoms show such a wide range in their variety and intensity. Cases of floating kidney have been mistaken for appendicitis, biliary or renal colic, and even Bright's disease owing to albuminuria or hæmaturia, or have been masked by such conditions as melancholia and migraine. *Per contra*, we have met with a case of tubercular deposit about a very movable cæcum which, amongst various diagnoses, had been mistaken for a case of floating kidney. Lastly, there is no doubt that every case is not suitable for operation, and some dismal failures from wrong diagnosis or improper selection have brought discredit on the operation just as occurred with promiscuous oöphorectomy and many other operations.

Dr. Suckling is a good example of a physician who has been converted from the palliative to the practical treatment in cases where the former is of no avail. Half a dozen years ago he read a paper before a meeting of the British Medical Association at Edinburgh, in which he stated that use of a well-fitting belt obviated the need for operation. Now he has written another paper, in which he has the candour and the courage to admit that:—"In my former paper I was wrong in stating that I thought a belt would do away the necessity of operation. I find that the belt does relieve, and even cure, but in very bad cases the kidney must be operated upon to effect permanent cure." In support of his change of opinion he gives examples of movable kidney associated with mental depression, hypochondriasis and even acute melancholia cured by nephropexy. He mentions a case of movable kidney associated with inability to walk from severe pain in the right lower extremity, of a case associated with long-continued nervous exhaustion, of another with Dietl's crises and constant ill-health, and of one combined with very severe migraine—in all of which fixation of the kidney led to a successful result.

Turning now to points about which there is more unanimity of opinion—all are agreed that the condition of movable or floating kidney occurs most frequently in women, and usually on the right side. Cases of both kidneys being affected are much scarcer, and cases of the left kidney alone being movable are very rare. It is often associated with hysteria, and with displacements of the uterus and adnexa.

In considering the mobility of the kidneys there are various anatomical and social factors to be taken into account. In the first place there is the congenital condition of a mesonephron as the cause of a floating kidney. Intra-abdominal pressure and the juxta-position of closely packed viscera help to maintain the mutual relations of the abdominal organs; but the kidneys, being retroperitoneal. have not the same advantage. The kidneys are maintained *in situ* by the tonicity of the abdominal muscles, by the renal muscles and by their adipose capsules of extra-peritoneal fat. The tonicity of the abdominal muscles is greater in the male from his more athletic habits, hence the less liability to displacement except from trauma, which is not a common cause. In the female, however, the tonicity is greatly diminished by the habitual use of corsets from puberty onwards, by constricting bands for the suspension of garments, and by the changes induced through pregnancy and repeated child-bearing. On the other hand, long-waisted, flabby young women with lax abdominal walls, who have never borne children, are prone to this affection.

Any serious illness with general loss of fat may lead to absorption of the adipose capsule, and this in turn tends to favour mobility of the kidney with its displacement; engorgement and increase of weight follow, especially if combined with traction and torsion of the organ, and then comes the distress from intermittent crises and hydro-nephrosis owing to kinking of the ureter. Some authorities state that the kidneys in the female are placed on a somewhat lower level than in the male. At any rate it is common to both sexes to have the right kidney usually on a lower level than the left one, and also a little further from the mesial plane. This may be owing to the superincumbent weight of the liver especially in tight-lacing females with the right lobe of the liver depressed or prolonged downwards. Or, again, the weight of the liver may come into play in preventing a return of the kidney to its normal position once displacement downwards has occurred.

The kidneys rest on a bed that is not flat, these are inequalities due to the psoas, quadratus lumborum, the diaphragm and the transversalis abdominis, which muscles are not on the same plane but slope towards one another. It is alleged that the renal pouches are shallower and wider at their lower extremities in the female. Then, as regards the anterior relations of the kidneys, they differ on the two sides. Both have the suprarenal capsule and the jejuno-ileum. The right has the liver, the second part of the duodenum, the ascending colon and hepatic flexure. The left has a small part of the stomach, separated, however, by the lesser sac of the peritoneum; the spleen, splenic vessels, the splenic flexure and the descending colon. It is said that the left kidney is more intimately connected with the left colon than is the case on the right side, and that there is less movement with the splenic flexure than is the case with the hepatic flexure. Lastly, the body of the pancreas is in contact with the left kidney, which may possibly help to give it greater fixity.

THE SERVICES IN 1903.*

THOUGH the long war in South Africa came to an end nearly two years ago, the prevailing note in the history of civilization still seems to be one of war. Throughout 1903 the British Empire has had on hand a small war in Somaliland, the column in the Aden Hinterland has had constant petty fighting, and at the close of the year an expedition has gone as a mission over the Tibetan frontier. In the Far East the long expected war between Russia and Japan seems to be upon the point of beginning,† and in the near East war has been smouldering in the Balkans throughout the year, and seems only too likely to break into a conflagration in the coming spring.

The most important event of 1903, as regards the Medical Services, was the issue of the new warrant for the I.M.S. This warrant gives higher pay on entering the service, and considerably increases the pay of officers serving with the army. Those in civil employ, however, who form nearly two-thirds of the whole, have not yet got the benefit of this increase. Another important advantage given by the new warrant is the grant of extension of service over the age of 55, to those who entered over 25 years of age, to enable them to earn the full thirty years' pension. As promotion to administrative rank can hardly be expected much, if at all, under thirty years' service, at least in Bengal and Madras, this concession is one of much importance to a number of men. The twenty years' pension was also raised from £365 to £400 a year. With these

* Contributed by Lieut.-Col. D. G. Crawford, M.B., I.M.S.

† As, of course, all our readers know, the war between Russia and Japan began early in February.

advantages there should be no difficulty in keeping up competition for appointments in the I. M. S.

In the R. A. M. C., the last warrant seems to have brought forward a good supply of candidates, and the complicated rules for examinations appear to have been worked in a reasonable spirit. There have been several resignations during the year among the junior officers, but in a service of the numerical strength of the R. A. M. C., a considerable crop of such resignations must always be expected.

During the whole year, not a single death occurred among the officers of the Bengal Medical Service. Such a thing has not happened for long, certainly not within the past twenty years; probably it never happened before. Though the service has been steadily sinking in numbers for the last seven years, it still numbered 263 men on 1st January 1904, and is still numerically the strongest of the four Indian Medical Services; though in another year it will certainly have lost that distinction. On 1st January 1904, the Bengal Service, as noted above, was 263 strong, Madras 117, Bombay only 84; while the new I. M. S. numbered 260. In between three and four years more, probably within ten years of its foundation, the new service will outnumber the three old ones combined.

The new I. M. S. received its "baptism of blood" during 1903, when Lieutenant F. W. Sime, the first of its members to fall in action, was killed at Gumburru, Somaliland, on 15th April. No less than eight of its members died during the year, while there were only two deaths in the Madras service and one in Bombay.

In our service lists figure several prominent members of the profession at home, who resigned their commissions early, and won distinction in other fields; Sir George Duffey, the Dublin surgeon, and Mr. Lawson, the ophthalmic surgeon, are included in the deaths; while Sir Patrick Heron Watson, one of the leading Edinburgh surgeons, appears among the Honours on being knighted. All three were formerly in the A. M. D., and all three served in the Crimea. Dr. W. S. Playfair, who also died during the year, began life as a Bengal Assistant Surgeon, and served in the Mutiny. He was for twenty years obstetric physician, and lecturer on obstetrics to King's College Hospital for twenty-five years, 1873-1898, and the author of the most readable work in the language on his speciality. The senior officer on the retired list of the Bengal Medical Service, Surgeon-Major W. Shillito, passed away on 5th January 1903; while another Bengal officer, little junior to Shillito and more prominent in his day, Surgeon-Major Charles Hathaway, Inpector-General of Jails in the Punjab, and Private Secretary to Lord Lawrence when Governor-General, died on the 29th August.

I.—BENGAL.

A.—DEATHS—*Nil.*

B.—RETIREMENTS.

No.	Rank.	Name.	Date.	REMARKS.
1	Colonel	T. H. Hendley, C.I.E.	10 April	
2	Lt.-Col	D. P. Macdonald	6 July	Extra pension.
3	,,	Z. A. Ahmed	19 ,,	Extra pension.
4	,,	S. H. Dantra	10 ,,	
5	,,	W. Owen	24 March	
6	,,	A. W. Mackenzie	31 Jan.	
7	,,	W. E. Griffiths	6 ,,	
8	,,	S. F. Bigger	1 Sept.	
9	,,	D. P. Barry	10 Dec.	
10	,,	A. W. D. Leahy	5 June	
11	Major	W. G. Thorold	15 April	On T. H. P. from 15 April 1901.
12	,,	B. K. Basu	21 Aug.	

C.—PROMOTIONS.

No.	Old Rank.	Name.	New Rank.	Date.	REMARKS.
1	Lt.-Colonel	S. H. Browne	Colonel	10 Apl.	*vice* Hendley, R.

D.—HONOURS.

No.	Rank.	Name.	Honour.	Date.	REMARKS.
1	Surg-Genl.	W. R. Hooper	K.C.S.I.	1 Jan.	(Retired).
2	,,	B. Franklin	K.C.I.E.	1 ,,	
3	,,	A. S. Reid	C.B.	26 June	
4	Surg.-Col.	J. Richardson	K.H.P.	26 Sept.	(Retired) v. Rice, D.
5	Lt.-Col.	G. Bomford	C. I. E.	1 Jan.	
6	,,	C. C. Manifold	Macgregor Silver Memorial Medal	—	For travels in China.
7	Major	A. W. Alcock	C. I. E.	1 Jan.	
8	Captain	V. E. Lindesay.	Royal Humane Society's Bronze Medal.	28 July	Hsinho, China.

E.—DEATHS OF RETIRED OFFICERS.

No.	Rank.	Name.	Date.	REMARKS.
1	S.-M.-G.	W. R. Rice, C.S.I.	27 Mar.	Brighton.
2	D. S.-G.	A. J. Dale	24 Nov.	London.
3	,,	J. Brake	8 Feb.	Southsea.
4	Surgn.-Col.	Sir G. Thomson, K.C.B.	—Dec.	Norwood.
5	Brig.-Surg.	J. Duncan	19 June	(1902), England.
6	B. S. Lt.-Col.	R. G. Mathew	21 Sept.	London.
7	Surg.-Maj.	W. Shillito	5 Jan.	Putney.
8	,,	C. Hathaway	29 Aug.	St. Leonards.
9	,,	R. T. Lyons	30 Mar.	Cambridge.
10	Surgn.	J. Reid	6 Mar.	London, suddenly.
11	Asst.-Surg.	W. S. Playfair	13th Aug.	St. Andrews.

II.—MADRAS.

A.—DEATHS.

No.	Rank.	Name.	Date.	REMARKS.
1	Lt.-Col.	W. H. Neilson	24 Mar.	Indore.
2	Major	A. E. Grant	13 Dec.	Bournemouth; diabetes.
3	Captain	S. A. C. Dallas	28 May	Bombay; liver abscess.

B.—RETIREMENTS.

No.	Rank.	Name.	Date.	REMARKS.
1	Colonel	A. M. Branfoot, C.I.E.	18 May	
2	,,	W. E. Johnson	30 June	
3	Lt.-Col.	H. Allison	23 Dec.	Extra pension.
4	,,	H. A. F. Nailer	20 Oct.	
5	Major	I. P. Doyle	31 Dec.	

C.—PROMOTIONS.

No.	Old Rank.	Name.	New Rank.	Date.	REMARKS.
1	Lt.-Col.	W. R. Browne	Col.	19 May	v. Branfoot, R.
2	,,	T. J. H. Wilkins.	,,	30 June	v. Johnson, R.
3	Major	D. Elcum	Lt.-Col.	18 Oct.	(Retired) For services in connection with South African War, outside South Africa, dated 18th Oct. 1902.
4	,,	E. R. DaCosta.	,,	18 ,,	

D.—HONOURS.

No.	Rank.	Name.	Honour.	Date.	REMARKS.
1	S.-G. ...	C. Colvin Smith	K. C. B.	26 June	(Retired.)

E.—DEATHS OF RETIRED OFFICERS.

No.	Rank.	Name.	Date.	REMARKS.
1	D. S.-G. ...	G. W. S. Ogg	15 Nov.	Bath.
2	B. S. ...	W. S. Fox	25 Dec.	London.
3	Lt.-Colonel	H. F. Esmonde-White	30 Oct.	Sydenham.
4	Surgeon ...	J. Colebrook	25 Sept.	London.

III.—BOMBAY.

A.—DEATHS.

No.	Rank.	Name.	Date.	REMARKS.
1	Colonel ...	A. H. C. Dane	10 Jan.	Karachi, Bright's Disease.

B.—RETIREMENTS.

No.	Rank.	Name.	Date.	REMARKS.
1	Lt.-Col. ...	J. W. Clarkson	31 March.	
2	,, ...	A. W. F. Street	2 April.	
3	,, ...	W. K. Hatch	15 Nov.	

C.—PROMOTIONS.

No.	Old Rank.	Name.	New Rank.	Date.	REMARKS.
1	Lt.-Colonel	J. P. Greany	Colonel	11 Jan.	v. Dane, D.

D.—HONOURS.

No.	Rank.	Name.	Honour.	Date.	REMARKS.
1	Lt.-Col. ...	R. W. S. Lyons.	K.-I.-H., 1 Class.	1st Jan.	

E.—DEATHS OF RETIRED OFFICERS.

No.	Rank.	Name.	Date.	REMARKS.
1	D. S.-G. ...	J. Gilbert	28 Jan.	
2	,, ...	J. F. Shekleton	15 April	Clifton.
3	,, ...	J. H. Sylvester	6 Dec.	London.
4	Surg.-Maj.	H. de Tatham	25 Nov.	
5	Surgeon ...	J. Roche	4 Oct.	

IV.—I. M. S.

A.—DEATHS.

No.	Rank.	Name.	Date.	REMARKS.
1	Captain ...	J. H. L. Beaman	6 Feb.	(1902) Kings' Lynn.
2	,,	J. Sloan	12 March	Mhow.
3	,,	H. R. Macnee	14 July	Shanhaikwan, China; bathing accident.
4	,,	P. A. Browne	5 Sept.	Bannu; enteric.
5	Lieut. ...	W. D. Pringle	3 ,,	Tientsin, China.
6	,	J. H. Ferris	15 June	Poona; enteric.
7	,,	F. W. Sime	15 April	Killed in action, Gumburru, Somaliland.
8	,	G. E. Humphreys	26 Sept.	Poona; Brights' Disease.
9	,,	F. P. Vieyra	26 ,,	Fort Sandeman.

B.—RESIGNATIONS.

No.	Rank.	Name.	Date.	REMARKS.
1	Captain ..	J. E. Robinson	1 Nov.	.....

V.—R. A. M. C.

A.—DEATHS.

No.	Rank.	Name.	Date.	REMARKS.
1	Colonel	W. B. Allin	8 Sept.	Landour.
2	Lt.-Col.	H. J. Peard, C.M.G.	18 Aug.	Middleburg, Cape Colony.
3	,,	E. R. Cree	29 Dec.	Wokingham.
4	Major	V. E. Hunter	26 March	Bombay.
5	,,	F. J. W. Stoney	6 ,.	London, [T. H. P. 19th May 1902].
6	,,	G. J. A. Tuke	—Oct.	London.
7	,,	L. P. Mumby	1 Dec.	Gosport, [T. H. P. 15th March 1901].
8	Captain	J. F. MacArdle	16 June	Khartoum; liver abscess.
9	Lieut.	J. C. Hastings	10 Jan.	Kamptí.

B.—RETIREMENTS.

No.	Rank.	Name.	Date.	REMARKS.
1	S.-G.	W. S. M. Price	11 Aug.	
2	,, ...	G. J. H. Evatt, C.B.	11 Nov.	
3	,, ...	T. O'Farrell	20 ,,	
4	Colonel ...	J. L. Notter	14 Jan.	
5	,, ...	J. P. Rooney	22 Mar.	
6	,, ...	M. D. O'Connell	15 Aug.	
7	,, ...	R. Exham	19 ,,	
8	,, ...	W. MacWatters	26 ,,	
9	,, ...	J. F. Supple	14 Dec.	
10	Lieut.-Col.	T. B. Tuckey	6 Jan.	
11	,, ...	U. J. Bourke	3 ,,	
12	,, ...	S. H. Carter	17 ,,	
13	,, ...	J. Anderson	14 Feb.	
14	,, ...	W. C. T. Poole	14 ,,	
15	,, ...	S. J. Rennie	28 Mar.	
16	,, ...	W. B. Miller	16 May	
17	,, ...	E. V. A. Phipps	27 ,,	
18	,, ...	J. A. Gormley	3 June	
19	,, ...	T. A. Dixon	13 ,,	
20	,, ...	A. W. Browne	15 July	On T. H. P. since 14th July 1900.
21	,, ...	H. J. Barnes	18 ,,	On T. H. P.
22	,, ...	J. Armstrong	29 ,,	
23	,, ...	F. A. Harris	9 Sept.	On T. H. P. since 24th Oct. 1901.
24	,, ...	A. Baird	3 Oct.	
25	,, ...	R. D. Donaldson	3 ,,	
26	,, ...	R. W. Mapelton	7 ,,	
27	,, ...	R. G. Thornsett	14 ,,	
28	,, ...	A. Hewett.	17 ,,	
29	,, ...	H. Grier	20 Nov.	On T. H. P.
30	,, ...	J. Riordan	12 Dec.	
31	Major ...	R. G. Thomson	7 Jan.	
32	,, ...	R. J. McCormack	19 Aug.	
33	,, ...	G. T. H. Thomas	26 Aug.	
34	,, ...	H. P. Birch	26 Sept.	On T. H. P.
35	Captain ...	E. Brodribb	20 Jan.	On T. H. P.
36	,, ...	H. F. Hart	24 Jan.	
37	,, ...	J. H. Farmer	14 Feby.	
38	,, ...	L. J. C. Hearn	27 June	On T. H. P.
39	,, ...	R. T. Brown	13 May.	On T. H. P.
40	,, ...	P. J. R. Nunnerl,	26 July.	On T. H. P. since 26th July, 1898.
41	,, ...	G. E. Hughes	26 Aug.	
42	,, ...	A. F. Heaton	7 Oct.	
43	Lieutenant	W. C. Stevenson	26 Aug.	
44	,, ...	F. L. Henderson	26 Sept.	
45	,, ...	C. H. Robertson	19 Dec.	
46	,, ...	K. C. Edwards	15 July.	

C.—PROMOTIONS.

No.	Old Rank.	Name.	New Rank.	Date.	REMARKS.
1	Colonel	W. J. Fawcett	Surg.-Genl.	1 April	On augmentation.
2	,,	W. J. Charlton	,,	11 Aug.	*v.* Price, R.
3	,,	W. L. Gubbins.	,,	27 Aug.	*v.* Wilson, became supy.
4	,,	J. D. Edge	,,	11 Nov.	*v.* Evatt, R.
5	Lt.-Col.	R. Batho	Colonel	18 Oct. 1902	*
6	,,	B. B. Conolly	,,	,,	*
7	,,	F. W. L. Hodder.	,,	,,	*
8	,,	P. K. Ray	,,	,,	*
9	,,	W. F. Ruttledge.	,,	,,	*
10	,,	F. W. Trevor	,,	14 Jan.	*v.* Notter, R.
11	,,	W. A. May	,,	22 Mar.	*v.* Rooney, R.
12	,,	G. D. Bourke	,,	1 April	*v.* Fawcett, P.

* Retired list for services in connection with South African War, outside South Africa.

C.—PROMOTIONS—(*contd.*)

No.	Old Rank.	Name.	New Rank.	Date.	REMARKS.
13	Lt.-Col.	J. C. Dorman	Colonel	11 Aug.	*v.* Charlton, P.
14	,,	W. L. Chester	,,	19 ,,	*v.* Exham, R.
15	,,	E. H. Feun	,,	26 ,,	*v.* MacWatters, R.
16	,,	T. J. P. Holmes	,,	,,	(Retired List)
17	,,	W. A. Wolseley.	,,	27 ,,	*v.* Gubbins, P.
18	,,	A. T. Sloggett	,,	9 Sep.	*v.* Allin, D.
19	,,	J. J. Morris	,,	11 Nov.	*v.* Edge, P.
20	,,	D. Bruce	,,	10 Dec.	Supy. for Uganda.
21	,,	J. F. Williamson.	,,	20 ,,	To complete establishment
22	,,	W. J. Rainsford	,,	14 ,,	*v.* Supple, R.
23	Major	G. H. M. Colman.	Lt.-Col.	18 Oct. 1902	*
24	,,	H. F. Dent	,,	,,	*
25	Captain	H. G. L. Chevers	Major	,,	*

* Retired list; for services in connection with South African War, outside South Africa.

D.—HONOURS.

No.	Rank.	Name.	Honour.	Date.	REMARKS.
1	S.-G.	T. Tarrant	K. H. P.	9 Sept.	*v.* Fraser, D.
2	S. M. G.	J. B. C. Reade	K. C. B.	26 June	
3	S. G.	G. J. H. Evatt	C. B.	26 June	
4	,,	A. Keogh	Kt. of St. John	—May	
5	Lt.-Col.	E. M. Wilson	,,	,,	
6	,,	W. Babtie, V.C.	,,	,,	
7	Major	D. Semple	K.-I.-H. 1st cl.	1-Jan.	
8	Captain	H. A. Bray	Medjidie 3rd cl.	—Feb.	
9	,,	H. N. Dunn	Medjidie 4th cl.	———	
10	,,	H. C. French	Albert Medal	—March	
11	,,	T. H. M. Clarke	C. M. G.	9 Nov.	Crete.
12	Asst.-Surg.	R. E. Bredon	C. M. G.	26 June	Retired.
13	,,	P. H. Watson	Knighted	26 June	Do.

E.—DEATHS OF RETIRED OFFICERS.

No.	Rank.	Name.	Date.	REMARKS.
1	Surg.-Genl.	E. B. Tuson	—Jan.	Torquay.
2	,,	A. H. Fraser	5 July	Slough.
3	S. M. G.	J. Davis	8 Nov.	Southsea, Angina.
4	,,	T. N. Hoysted	12 Aug.	Sidcup.
5	D. S. G.	G. B. F. Arden	—April	On board S. S. *Zweena*, returning from Madeira.
6	Colonel.	F. B. Scott	27 April	Tivoli, Rome.
7	B. S.	A. C. Robertson	15 May	London.
8	Surg.-Lt.-Col.	R. V. Ash	18 Sept.	Morecambe.
9	,,	V. Wearne	15 Oct.	Spitzbergan, Jamaica.
10	Lt.-Col.	E. Eustace	16 Feb.	Cheltenham; pneumonia.
11	,,	T. S. Cogan	—	
12	,,	G. Hare	14 Sept.	Bournemouth.
13	,,	T. W. Patterson	2 Sept.	Ramelton, Ireland.
14	Surg.-Maj.	W. Venour	4 Feb.	Saundersfoot.

E.—DEATHS OF RETIRED OFFICERS—(*contd.*)

No.	Rank	Name.	Date.	REMARKS.
15	,,	T. Carey	2 June	Hove, Brighton.
16	,,	A. Sharpe	19 Aug.	Dublin.
17	Surg.-Maj.	T. W. Wright	10 Nov.	
18	Surgeon	M. S. Grace	19 April	Wellington, New Zealand.
19	,,	J. Murray	24 July	London.
20	Asst.-Surg.	H. W. Hubbard	7 Oct.	,,
21	,,	G. Lawson	12 Oct.	,,
22	,,	Sir G. F. Duffey	13 Oct.	Dublin.
23	,,	R. J. B. Cunynghame	23 Dec.	Edinburgh.

LONDON LETTER.

THE LONDON SCHOOL OF TROPICAL MEDICINE.

SIR PATRICK MANSON recently delivered an address at this school on "what it has done, is doing, and hopes to do." After referring in terms of warm laudation to the interest taken by the late Colonial Secretary, Mr. Joseph Chamberlain, in promoting education in tropical medicine and the hearty support given by the Seamen's Hospital Society to the starting and organisation of the Institution, he proceeded to give some particulars regarding its work and the contributions which have been made by its alumni to medical progress. Since the opening of the school on the 3rd of October 1899, 384 students have passed through it and obtained practical instruction in the nature, diagnosis and treatment of tropical diseases. Many of these students have carried with them the lessons learnt and methods of research taught to the field of their labours in tropical countries, and turned them to profitable account, while all of them have no doubt found the experience gained useful in practice. The statement of scientific work done by men connected with and trained in the school is highly creditable. It must not be forgotten that they have derived both inspiration and stimulus from Manson himself. The address has been published *in extenso* in the medical journals, and in abstract in the leading newspapers. It is given in full detail in the January number of "Climate," an excellent quarterly journal of tropical medicine edited by Dr. Charles F. Harford, the Principal of the Livingston College. This number gives some particulars regarding the history and work of the Liverpool School of Tropical Medicine and the institution over which he presides. This latter is intended to give medical instruction to missionaries. It was founded ten years ago. The curriculum extends over nine months, and consists of three courses of instruction in Anatomy and Physiology, Materia Medica, Medicine, Surgery and Therapeutics. Attention is also devoted to eye and skin diseases, tropical diseases, nursing and hygiene. The clinical training is obtained in selected London hospitals, and a laboratory has been fitted up for the use of students in the college building, which is residential. No doubt missionaries find the education thus obtained interesting and serviceable; but I am inclined to doubt whether a safe knowledge of medicine can be attained in nine months, however enthusiastic the teachers and earnest the scholars.

It is curious to find that what professes to be a special educational number of "Climate" should omit all reference to the education in tropical diseases, which for the last forty years has been given in the Army Medical School at Netley and is now being given in the Royal Army Medical College, London, and to the excellent work done by those who have passed through the Netley School.

SUPERANNUATION.

The question of age-limit has cropped up in rather an acute form in the Edinburgh Infirmary. The practice in this institution is to elect the staff for periods of five years—thrice renewable, and to assign wards for purposes of clinical instruction to certain University Professors. Recently the managers resolved to impose an age-limit on their ordinary physicians and surgeons, and fixed this at sixty-five years without prejudice to present incumbents. This rule is a reasonable one and consistent with the practice of London hospitals. It accelerates promotion, introduces fresh blood and guards against senile incompetence or perfunctory attendance in consequence of pressure of private work. It is, moreover, in consonance with the tendency of the age. It may bear hardly on individuals in some cases, and seems to depreciate maturity and experience; but the rule is, on the whole, a sound and good one. At the annual meeting of the contributors to the Royal Infirmary, it was decided to "go one better" and apply the 65 years' limit to the University professors also. Now, seeing that there is no similar qualification regarding the tenure of the University chairs, the effect of the decision will be either to deprive the professors of Medicine and Surgery of the power of giving clinical teaching to their students after they have attained the age of 65, or to compel

the University to make other and independent arrangements for clinical education. The position is somewhat anomalous and cannot obviously remain as it is. In the case of the professor of Clinical Surgery, the successor of Syme and Lister, who lectures in the Infirmary and holds the premier surgical appointment, it seems specially untenable. Moreover, the rule if rigidly carried out deprives the sick poor of Scotland of the privilege of obtaining the advice and services of the University professors, which has hitherto been eagerly sought and highly valued. I cannot help thinking and hoping that the new law will not, on reconsideration, be as the laws of the Medes and Persians.

RADIUM.

The marvels of radium continue to be the subject of lectures, newspaper and magazine articles, and of general curiosity and interest. A substance so rare and costly, that generates heat and light spontaneously and perpetually emits material emanations, and three descriptions of very penetrating rays, and exercises a destructive effect on organic tissue, cannot but excite wonder and stimulate imagination. The questions of most interest to medical men are—Can its properties be turned to therapeutical use? Can its emanations and rays be employed for purposes of more exact diagnosis? Or can its destructive power over living tissues be so ordered that virulent microbes may be killed, while the tissues in which they are situated escape injury? Or can tissues of low organization and weak stability—embryonic or malignant—be dissolved while more mature and stable structures remain unaffected? These questions are at present in the stage of speculation, and can only be resolved by experimental research, but they seem to be very pertinent and important.

SURGEON-GENERAL SIR WILLIAM ROE HOOPER K.C.S.I.

This very popular and efficient officer relinquished on the 12th of January the office of President of the Medical Board at the India Office, to which he was appointed in succession to Sir Joseph Fayrer, Bart., nine years ago after a long and very meritorious career in the Indian Medical Service. The duties of this appointment include not only the examination of sick officers and of candidates for Indian services, but the delicate and responsible task of advising the Secretary of State for India on all questions of medical and sanitary administration. In both capacities Sir William Hooper was eminently successful. His thorough knowledge of Indian life and tropical diseases, combined with tact and kindliness, fitted him conspicuously for the duties of the Medical Board. The other duties were necessarily performed confidentially, and Hooper's share in the settlement of service questions, the selection of doctors and nurses in emergencies, and the disposal of the continual current of references which come from India regarding medical and sanitary questions, cannot be known outside of the India Office. Without betraying any confidences I am in a position to state that his advice and assistance in these matters were highly valued, that he was loyal to his service and lost no opportunity of promoting its interests, and that his opinions were always well weighed, sound and judicious. He is succeeded by Colonel A. M. Branfoot, C.I.E., of the Madras Medical Service—the first Madrassee, as far as I know who has held this office. His Indian reputation is high, and there is every reason to believe that he will worthily fill a position which has been held by Martin and Fayrer, the duties of which, as Indian administration becomes more complicated and active, are undergoing a corresponding increase in weight and elaboration.

K. McL.

20th January, 1904.

Current Topics.

CEREBRO-SPINAL FEVER.

CAPTAIN ROBERTSON MILNE, I.M.S, has returned to Kasauli and has resumed his investigation of Cerebro-spinal Fever. It is hoped that all Regimental Medical Officers, Civil Surgeons and Jail Superintendents will do what they can to help Captain Milne in this enquiry. Material from *all cases of "Meningitis"* whether cerebro-spinal or not, is required, and all officers who are likely to meet with such cases are invited to communicate directly with Captain Milne at the Pasteur Institute at Kasauli, who will send them instructions and the necessary apparatus.

POLYPHARMACY IN PLAGUE TREATMENT.

THE following is an example of the way in which European medical treatment gets dis-

credited in the East, and of the unreliability of the statistics on numerous vaunted modes of treatment. This blunderbuss prescription given *verbatim et literatim* was evolved by an Indian practitioner, and was, or is still, much in vogue in the Central Provinces. It has been frequently prescribed for people suffering from ordinary "fever," and on their recovery they were cited as examples of recovery from plague under this particular treatment.

"Prescription for Plague:—

℞.

Spt. Ether Nitrosi	℥ii
Ammo. Chloride	3i
Tinct. Cincho. com.	℥ii
Mag. Sulph.	℥vi
Pot. Nitras	grs. xii
Tinct. Digitalis	m. xii
Tinct. Nucis Vomicæ	℥ss
Spt. Ammo. Aro.	℥iii
Spt. Vini Gallici	℥vi
Spt. Chloroform	℥i
Aqua Anethi	℥iii
Aqua Mentha Pip ad .. .	℥vi

"℥i every half or one hour until fever is reduced, and four or five motions occur: this will cause profuse perspiration and redness of eyes diminish.

"Put emplastrum hydragyri over the bubo and after two hours, continuous hot applications of linseed poultices every half hour without break.

"If the mixture on the first dose causes ringing in ears, and profuse saliva and tears in eyes, and burning in the tongue, the patient will surely recover.

"If it occurs on second dose the patient will recover with difficulty. If three doses produce no effect, *i.e.*, no abatement of fever, no purge, &c., the case will be fatal.

"Buboes to be opened when ripe: raw should not be disturbed.

"Tinct. Iodine in one or two minims doses recommended and may be added at the discretion of Medical Officer when the plague is of Pneumonic type."

COLLARGOL.

CREDE of Dresden has brought the use of silver as an antiseptic into prominent notice. He first used the citrate and lactate of silver for wound dressings, and later he employed collargol as a direct antiseptic in internal diseases. The latter is a black brittle substance, with a slight metallic lustre, forming an opaque black liquid with 1 to 25 of distilled water. Weaker solutions have a brown colour, and leave an iridescent film on drying. Dr. Fortescue-Brickdale has reviewed its physical and physiological properties, its mode of application and the clinical results in an article in the *Bristol Medico-Chirurgical Journal* for December. It is employed as an ointment for inunction in the strength of 15 per cent., and a fresh solution is used for intravenous injection; 5 to 10cc. of a 1 per cent. are injected once daily or at intervals of two or three days. Intravenous injection quickly sets up leucocytosis, the blood retains the colloid silver in solution, and it is rapidly eliminated without poisonous symptoms. A 1 per cent. collargol solution prevents growth in cultivations of B. authracis, S. pyogenes aureus and S. pyogenes, but solutions weaker than this have no bactericidal effect. In living blood plasma the inhibitory and bactericidal effect is probably less than in broth cultures. Dr. Fortescue-Brickdale draws the following conclusions:—

Collargol has not been introduced into the human body in sufficient quantity to produce an antiseptic effect, experiments negative its having any effect on septicæmia artificially produced in rabbits. The published records show no beneficial effects in general pyæmia or septicæmia in man. In some cases of general toxæmia it appears to produce a fall in the temperature and slight improvement, such as sometimes follows the use of antipyretics and hydrotherapy.

Clinically collargol has been used in cases of tuberculosis, anthrax, broncho-pneumonia, rheumatic pericarditis, cerebro-spinal meningitis, mastoid disease, furunculosis, erysipelas, scarlet fever, enteric fever, puerperal fever, empyema, osteomyelitis, perinephric abscess, and gangrene. In spite of an application comprehensive enough for a quack nostrum, collargol can scarcely be said to have maintained its reputation.

PRIORITY AS TO THE PRACTICE OF ASEPSIS IN CHILDBIRTH.

WHO originated the modern rational prophylactic treatment of woman in childbirth? In our student days many of us were taught that the honour belonged to Semmelweis, and so says Dr. Von Gyory of Budapest in Janus. He it was who showed the danger of cadaveric poisons, and urged the use of the nail-brush and washing the hands in chloride of lime solution. To his teaching indeed is due the reduction of puerperal fever in Germany. He urged his views on a hostile medical profession about 1848; but Dr. Simon Baruch, of New York, maintains in the *Therapeutic Gazette* for the 15th December, 1903, that Oliver Wendell Holmes was practising and teaching the same measures in 1861. He states that:—"It may therefore be claimed for my country that here the use of chloride of lime solution for the prophylaxis of puerperal fever was practised *thirteen years before* Semmelweis's monograph appeared, and that the transmissibility of puerperal fever by reason of neglect of the attendants and its prevention by cleanliness, &c., was here taught (by Holmes) with an earnestness and eloquence, and despite of opposition by the most eminent obstetricians, *five years before* Semmelweis appeared upon the scene, and one year before he received his medical degree."

AN APPARATUS, DESIGNED TO DETECT THE FEIGNING OF AMBLYOPIA OR OF MONOCULAR AMAUROSIS,

INVENTED AND DESCRIBED BY

DR. G. VAGLIASINDI DEL CASTELLO.

Surgeon-Lieutenant of the Italian Reserves.
(Translated with assistance from the Italian and abridged by Major R. H. Elliot, M.B., B.S. (Lond.), F.R.C.S. (Eng.), &c., Indian Medical Service, Madras.)

AT the instance of the Madras Government, His Excellency the Secretary of State for India most kindly furnished me with introductions to the various European Governments, in order to enable me to visit the eye-hospitals of the Continent, and it was thus that at Rome I met Dr. Del Castello, who most kindly demonstrated his apparatus to me, and gave me permission to use his monograph in any way I wished; that monograph appeared in the Medical Journal of the Roman Army (August 1901). I have endeavoured to keep as closely as possible to the style of the original, and am greatly indebted to Mr. S. Lawrence of Messrs. Lawrence & Mayo, and to another for valuable help in the translation.

In his early pages Dr. Del Castello deals with the difficulty of correctly diagnosing amblyopia or monocular amaurosis in subjects who have no objective signs to show for the defect, and who may have a motive in leading the examiner astray; it is with this class of cases that his paper is concerned. He then reviews the various methods hitherto invented for the diagnosis of such conditions, not a few of which we owe to the Italian Army Surgeons. Having thus cleared the ground, he summarises the case in the following words:—

"All the diagnostic methods referred to operate unsatisfactorily by themselves and demand each other's assistance. In fact they are attended with three important defects:

1. It is impossible with any of them to make more than one experiment, except in the case of Chauvel's modified system which permits of two being performed.

2. A subject under examination who is perfectly acquainted with the diagnostic methods, can guard against illusion, even without closing one eye.

3. None of these methods enable the examiner to ascertain whether the patient is really amblyopic.

My aim in inventing my instrument has been to eliminate the three defects referred to, for this must constitute the foundation of any efficient and accurate instrument for the diagnosis of simulated monocular amblyopia and amaurosis.

I said that one experiment only could be performed with any of the above methods of illusion, except in the case of Chauvel's system.

Now if the subject under examination closes one eye once only, he becomes aware of the illusion, and then the diagnostic method ceases to answer its purpose.

With my instrument, as we shall see presently, I have done away with this first defect, and in fact I can perform nineteen experiments with it; hence the patient, in order to deceive the examiner, would have to close one eye nineteen times.

I need not point out that if I repeat each of these tests ten or twenty times, the patient (not knowing whether he sees with one eye or with both eyes, or whether he sees two images or only one with one eye, or again whether the image is straight or crossed) is absolutely unable to guard against the test, for to avoid being found out, he would have to close one eye more than 100 times.

I stated that the ordinary methods of diagnosis are such that it suffices to know them not to fall into the trap, even whilst keeping the eyes open. For instance, assuming the shamming patient is acquainted with Prato's binocular hemioscope, if he knows that it consists of two tubes and that the image on the right is seen with the left eye, and the image on the left side with the right eye, he will be able to guard against the test and to pass himself off as a monocular amaurotic.

This does not occur with my instrument.* Anyone, who is thoroughly acquainted with its construction and working, can be deluded just as if he had never heard of it before.

I stated that by none of the above-mentioned methods of delusion can monocular amblyopia be diagnosed.

To anyone looking with the amblyopic eye, the images appear blurred, whilst to the sound eye they appear as they are in reality. Now if the patient wishes to simulate monocular amaurosis, he will affirm that he does not see the blurred images.

With my instrument, however, as we shall see presently, we can detect simulators and measure their acuteness of vision.

In reality a monocular amblyope in order to see whether an image is blurred, compares it with the image perceived by his sound eye (that is, in cases of amblyopia consistent with military service). Now if we intercept the visual line of the sound eye, the shammer will infallibly fall into the trap. By intercepting, on the contrary, the visual line of the amblyopic eye, we can ascertain whether the patient tries to simulate or to exaggerate visual defect. I need not add that if I submit to vision simultaneously images which are blurred and others which are not, confusion will necessarily ensue.

Description of the apparatus.—This consists of the following principal and accessory parts—

(1) *Principal*—(A) a box, (B) 2 tubes, and (C) a lid.

* This statement is absolutely correct. Under examination with this apparatus, I find myself and others wholly unable to deceive the examiner.

(2) *Accessory*—(D) 4 diaphragms, (E) a set of geometrical figures and crosses, and (F) a mechanism to move the last named.

The box (see fig. 2) is about 31 cm. long, 13 cm. wide and 11 cm. high; it has four walls and three spaces which we must consider in turn.

Anterior wall: on its outer face are two eye apertures, and a cavity to receive the nose.

Posterior wall: on its inner face are seen four perpendicular apertures (see fig. 6), which occupy the whole thickness of the wall, and nearly its whole height; through these pass four bars, each of which carries a rectangular sheet, on which are a series of figures; on the outer face of the wall are four buttons, by means of which each of the aforesaid sheets can be moved up and down, or fixed at any desired height; below the button of each bar is an indicator, which rises and falls with the button, and which shows on an attached index, not only the figures presented to the examinee, but also the minimum acuity of vision required by him for the perception of the figure in question (see fig. 3); the same figure also shows a large button in the centre of the posterior wall, which by means of a metal bar communicates with tube No. 1 (see fig. 1); this tube is N-shaped, and presents two anterior and two posterior apertures; by turning the button the tube can be rotated about the axis of the bar, so as to bring the oblique barrel in front of either eye at will; a small indicator on the button shows the exact relations of the N-tube. We can thus tell at any time which eye is in relation with the oblique barrel, and what objects are exposed to the view of the examinee; should he be blind of one eye, we can tell exactly what he ought to be able to see with the other, and should he be amblyopic, we can estimate his acuity of vision by the size of the figures he can read.

The lateral walls: on the outer face of each wall, in front is a small button, by pulling which we move a diaphragm which serves to close or open the corresponding eye aperture (see fig. 5, and also figs. 2, 3 and 4). Posteriorly we find on each side of the wall a vertical slit, in which travels a lever armed with a button; by lowering either button we close the corresponding posterior aperture of the tube (see figs. 2 and 3).

The box is divided into three spaces by two partitions: the anterior space is 1 cm. long, and as wide as the box; it is formed by 4 walls, three of which are those of the box, while the fourth is a partition, which present two apertures corresponding with the two eye-apertures in the anterior wall; on the anterior face of this wall are the two diaphragms already alluded to as designed to close the anterior apertures of the N-tube (see figs. 4 and 5).

The second space is as long as the N-tube; it is bounded in front by the anterior partition, laterally by the sides of the box, and behind by the posterior partition, which is perforated by two apertures in a line with those of the anterior partition; there are two other apertures in this partition of which we will say more later on; the apertures in the two partitions fit exactly with the corresponding apertures in the N-tube, when the latter is in either of its positions of adjustment (see fig. 4).

The third space lies between the posterior partition, the posterior wall of the box, and the corresponding parts of the two lateral walls; on the posterior partition play the two diaphragms which serve to close the posterior apertures of the N-tube (see fig. 4).

The lid of the box is jointed, and its anterior part, hermetically sealed, encloses the anterior and middle spaces of the box; while the posterior part moving on a hinge carries a mirror, by means of which the figures can be better illuminated (see fig. 3).

The figures on the tablets consist of squares, triangles, circles and crosses, each kind of figure occurring in seven sizes; the arrangement of the figures is as follows:—On the first line are sizes 1 and 6; on the second sizes 2 and 7; on the third, size 3; on the fourth, size 4, and on the fifth, size 5; on each tablet all four kinds of figures are represented.

To work the apparatus.—Direct the examinee to look through the eye-apertures; at the back of the box he will see three figures; 2 of these, the lateral ones, are seen by one eye only (*i.e.*, by the eye which commands the anterior junction of the oblique tube), whilst the central figure is seen by the opposite eye.

We will take first a case of simulated right amaurosis, and make our experiments.

Experiment No. 1.—The anterior union of the two branches of the tube is opposite the examinee's right eye; he therefore sees two figures (the lateral ones with this eye), while with the left he sees only the middle figure. Even should he know the apparatus it will be impossible for him to say with which eye he sees one figure, and with which the two, unless he closes one eye.

Experiment No. 2.—Reverse the N-tube, and repeat the previous experiment. The results are obviously reversed.

Experiment No. 3.—The tube for seeing a single figure is placed opposite the right eye; draw out the right anterior button (situated on the right side of the box in front), thus closing the right anterior eye-aperture; the left eye alone will be available, and it will see the two lateral figures, while to the examinee it will appear as if each eye saw one figure.

Experiment No. 4.—Replace the button, and reverse the tube; the left eye now looks down the single tube and sees one letter only, while the right sees two figures; close the left anterior aperture by means of its button; now the right eye is seeing two figures, while the left sees nothing. Again the examinee seems to see one figure with each eye.

Experiment No. 5.—Replace the left button; the left eye sees one figure, the right two. Draw the anterior right button till it half closes the anterior right aperture; only two figures are now seen, for the oblique branch of the tube has been closed; the right eye sees the right figure, and the left eye the left figure.

Experiment No. 6.—Replace the right button; lower the right posterior button, to close the right posterior aperture; two figures are now seen, the left one by the right eye, and the right one by the left eye; the images are crossed.

Experiment No. 7.—Replace the lower button, reverse the tube, and close the left posterior apertures, we are repeating the previous experiment with the opposite eye. The results are obviously reversed.

Experiment No. 8.—The tube is as before; close the right anterior and left posterior apertures; a single figure is seen with the left eye, but as it is on the right tablet, it appears to be seen with the right eye, opposite to which it lies.

9th Experiment.—Replace the displaced buttons, reverse the tube, and close the left anterior and right posterior apertures; a single figure is again seen and this time by the right eye; as before optical illusion leads the subject astray, and he now thinks he sees the figure with his left eye.

A similar set of experiments may be used for simulated amaurosis of the left eye. If the subject feigns amblyopia, or is really amblyopic, his acuity of vision can be estimated by the size of the type he can see.

Experiments with the N-tube with a separate branch.

Remove N-tube No. 1 and substitute tube No. 2. This is like an N with a separate branch; it presents two anterior and three posterior apertures; it has two parallel and one oblique branch; to this latter so much obliquity has been given as suffices to make its visual axis meet that of the free tube on the corresponding middle tablet; in other words, these lines of vision meet upon the geometrical figures on the right or left side according to the position of the tube. We have said that the posterior wall of the middle space shows four apertures; of these the two lateral ones correspond to the two posterior apertures of the parallel branches of the tube, whilst the central pair correspond with the posterior apertures of the oblique branch in its two positions. Let us take now the experiments we can perform with the tube No. 2, remembering that with this tube the only figures seen are those on the two middle tablets.

Experiment No. 1.—The oblique branch is directed from the left eye towards the right-hand tablet, two figures are seen; the right hand one by both eyes, the left hand one by the left eye only.

2nd Experiment.—Close the posterior aperture of the straight tube on the left; one single figure on the right side is now seen by both eyes.

3rd Experiment.—Replace the left posterior button, and close the posterior (or anterior) aperture of the free (right) branch; two figures are seen, but both of them by the left eye alone.

4th Experiment.—Replace the button and now close the anterior aperture of the oblique branch by half drawing out the left anterior button; two figures are seen, the left by the left eye and the right by the right eye.

5th Experiment.—Replace the button, and close the posterior aperture of the straight left branch, and either aperture of the free branch; a figure is now seen by the left eye through the oblique branch, but it appears to be seen by the right eye, because it is in a direct line with it.

Replace everything and reverse the tube.

The inventor now describes a farther series of five experiments; it seems unnecessary to give them at length, as No. 6 corresponds to No. 1, No. 7 to No. 2, and so on, the only alteration required being the substitution of the term left for right, and *vice versâ*. Dr. Del Castello then continues as follows:—

In the 1st and 6th experiments performed with tube No. 2, it may be that instead of seeing two figures, three are seen, two of which are identical; this is, of course, due to the failure to fuse the image seen by the two eyes. It does not vitiate the experiments, even if this does happen, provided we know and allow for the occurrence.

Take now a case of monocular amaurosis with the 1st experiment, if there is a blind left eye, the subject sees one figure on the right side; if blind of the right eye, he sees two figures one on each side.

With the 2nd experiment, a subject blind of either eye, must still be able to see one figure on the right side with the healthy eye, whichever that may be.

With the 3rd experiment, if the left eye is blind, no figure will be seen, whereas if the right eye only is blind, two figures will be seen with the left.

In experiment No. 4, only the figure on the healthy side is seen.

With the 5th experiment no figure will be seen if the left eye is blind, whereas in the case of the right eye alone being blind, one sees a single figure on the right side.

It will not be difficult to deduce what a subject affected with monocular amaurosis should see, in experiments 6 to 10.

For left monocular amblyopia, we must do experiments 2, 3, and 5, while for right amblyopia we require experiments 7, 8 and 10.

The inventor then proceeds to notice the chief defects found in the various means hitherto employed to detect pretended amblyopia or pretended monocular amaurosis; he summarises these defects as follows:—

(1) With each of the previously invented means, with the exception of Chauvel's, one can only do one experiment, and in consequence if

the subject shuts the eye once, he has the key to escape detection.

(2) If the subject has learned the principle of these various means of diagnosis, he can deceive the examiner, without even closing an eye.

(3) With none of those means can we diagnose a case of true monocular amblyopia in the case of a man who is feigning amaurosis.

We believe we have avoided the first inconvenience by introducing an apparatus capable of performing 19* experiments, *i. e.*, 9 with tube No. 1, and 10 with tube No. 2. We believe we have avoided the second danger by the construction of the N-tubes.

We have, in our opinion, removed the 3rd defect by the aid of experiments Nos. 3, 4, 8 and 9 with tube No. 1, and with experiments Nos. 2, 3, 5, 7, 8 and 10 with tube No. 2.

Final remarks by the translator:—The value of this apparatus will be obvious to all who have any experience of recruiting for the public services.

Messrs. Lawrence and Mayo, through whom I am obtaining my own specimen, have kindly consented to obtain others if required, or even to have them made in London if the demand is sufficient. The inventor has kindy given me a free hand in the matter.

Review.

The Practical Study of Malaria and other Blood Parasites.—By J. W. W. STEPHENS and S. R. CHRISTOPHERS. Longmans, Green & Co. 10*s.* nett.

THE bewildering rapidity with which progress has recently been made in our knowledge of malaria has rendered it very difficult for even medical men to keep up to date on the subject, especially those who work at a distance from medical libraries, so that it is not surprising that so little practical results have yet been obtained in India by the application of recently acquired knowledge of the subject. The Malaria Commission of the Royal Society have had unique opportunities of studying malaria in all its aspects during their four-year steady work in Africa and India, and they have done a great service in publishing a handy volume clearly describing all the methods used by them, and containing a summary of the practical results of their inquiry in a much more accessible form than their scattered reports to the Royal Society. In their introduction they state that in their experience many medical men in the tropics are only deterred from undertaking researches in tropical diseases by the impossibility of obtaining the necessary knowledge of methods, although the whole technique of malaria can be carried out with a very small amount of apparatus. This is very true, although we are inclined to doubt whether, in these days of pushing rival schools of tropical medicine, Indian work always receives the acknowledgment it deserves.

The first part of the present work deals with malaria, the preparations and staining of films, the normal and abnormal constituents of the blood, the forms of the malarial parasite and their distinctions, and the subsidiary signs such as pigmented leucocytes and the increased percentage of large mononuclears being all dealt with. The frontispiece shows a coloured illustration of the malignant tertian parasite prepared by Ross' method, but apart from this there are no coloured plates showing the different forms of malarial parasites, although two excellent plates of trypanosoma are included.

In another edition we should like to see this important omission rectified. The next and longest part of the book deals with life history, anatomy and dissection of mosquitos, and a very excellent description of the classification and differentiation of more especially the anopheles, with a list of those found in different countries. The characters of the larvæ and eggs are also very clearly given, so that with the help of these chapters we have been able to identify several larvæ without difficulty, this information not being available in any other book we know of. The importance of this lies in the fact, first established by the authors, that in Nature only certain species of anopheles are found to be carriers of malaria, so that it is not sufficient to know that this family of mosquitos are present in numbers, but the exact species as found in native houses, and whether they are infected with the sporozoites of malaria must also be known before the breeding places of the incriminated species can be found and attacked. Thus the authors found that the common mosquito of Calcutta, Mym. Rossii, does not ordinarily carry malaria in nature, although it can be infected artificially, and in this way the fact, which was previously pointed out, that the maximal prevalence of anopheles does not coincide with that of the prevalence of malarial fevers in Calcutta, is explained. Now that the authors have described in full detail their methods of research, it will be comparatively easy for Indian medical men to gradually and steadily supplement the information yet available as to the different factors in the spread of malaria in different parts of India, as it will only be possible to reap the full benefits of recent advances in our knowledge in proportion to the extent to which these practical details are worked out.

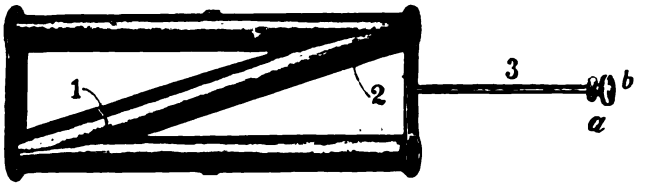
It is of interest to observe that the authors found the spleen rate in children between the

* These 19 experiments can be performed in any order, and repeated over and over again, so that their number is really legion. On the other hand, one flagrant mistake such as a pretended left-amaurotic reading the single figure in experiment 5 with N-tube No. 2, will hopelessly condemn the examinee.

R. H. ELLIOT.

APPARATUS FOR THE DETECTION OF FEIGNED MONOCULAR AMAUROSIS.

Fig. No. 1.—Tube No. 1. (N-shaped.)

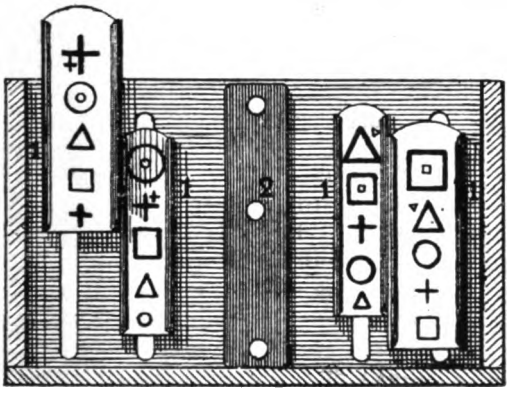


1. Anterior union of 2 branches of the tube.
2. Posterior ditto ditto.
3. Bar to reverse the tube.
   a Indicator to show the position of the post-r union of the 2 branches of the tube.
   b Button by means of which the tube is reversed.

Fig. 7.—No. 2 Tube (N-shaped with one branch separate).

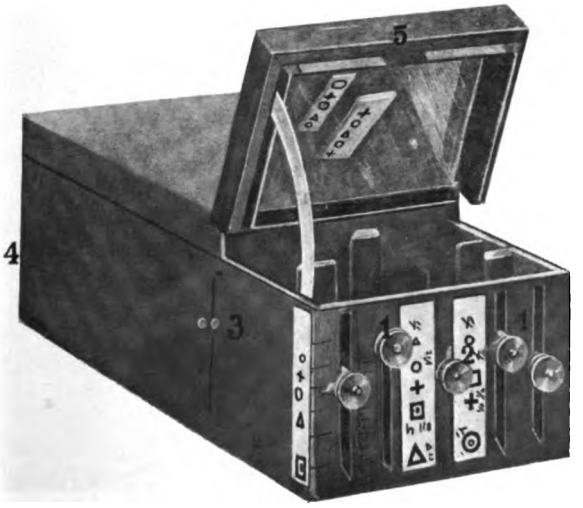
1. The separate branch.

Fig. 6.—Post-r Wall of the Box (Internal Face).



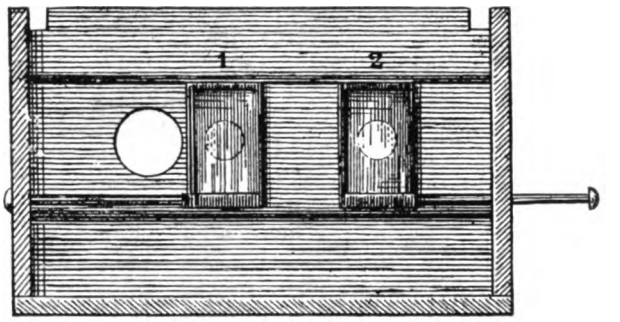
1. Tablets carrying the type.
2. Aperture for the passage of the bar which reverses the N-tube.

Fig. 3.—Box seen from behind.



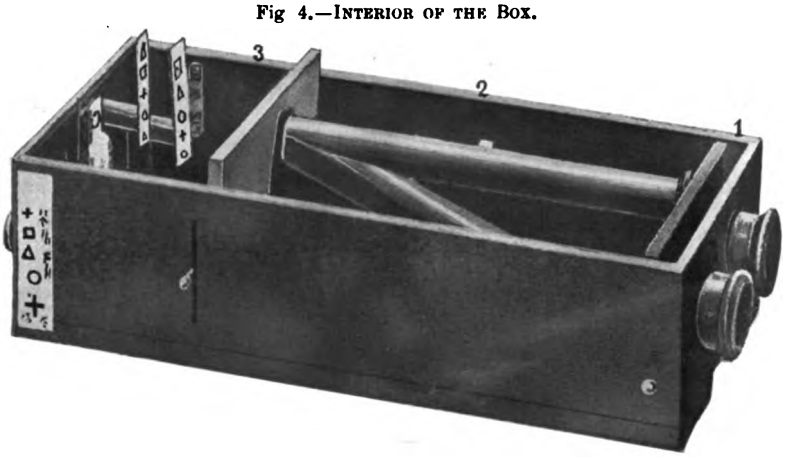
1. Button to move bar carrying the type.
2. Button to reverse the N-tube.
3. Right post-r button to close post-r (right) opening of the tube.
4. Right ant-r button to close ant-r (right) eye aperture.
5. Mirror on hinged lid.

Fig. 5.—Post-r face of ant-r Partition.



1. Left ant-r diaphragm (open).
2. Right ant-r diaphragm (closed). The buttons and bars of these shutters are also shown.

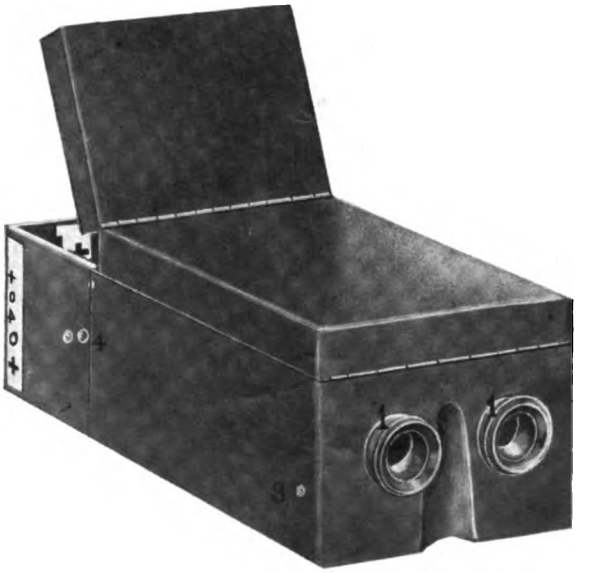
Fig 4.—Interior of the Box.



1. Ant-r space. | 2. Middle space. | 3. Post-r space.

FEIGNED AMBLYOPIA OR OF—

Fig. 2.—Box in position for Examination.



1. Eye apertures. 2. Groove for nose.
3. Ant-r lateral (left) button to shut left eye aperture.
4. Post-r lateral (left) button to shut left post-r aperture of N-tube.

ages of two and ten years to vary in Bengal proportionally with the parasite rate, but the former was about double the latter. This is important, as very few civil surgeons could afford to examine the blood of a number of healthy children to find the parasite rate or "endemic index," but spleen counts can easily be carried out when inspecting vaccination. In children under two the authors found the spleen rate to be lower than the parasite rate.

The remaining sections contain much valuable information on other blood parasites, such as the trypanosoma, piroplasma, filaria, etc., while an appendix describes the biting flies and fleas. We have come across a few printers' errors and a wrong reference to a figure. In the description of the anopheles the nomenclature is not quite the same as in the author's Royal Society's reports, that described as A. Christophersi in the latter being given as Listoni in the present book without the synonym being mentioned, which may cause confusion. The book is one which should be in the hands of all who desire to be up to date on the subject of malaria, while it is absolutely essential to any who wish to take their share in the practical application of modern research in the prophylaxis of the most, important of all tropical diseases.

Medical Jurisprudence for India.—By J. B. LYON, C.I.E., F.C.S., F.I.C. Revised and brought up-to-date. By L. A. WADDELL, M.B., C.I.E., LL.D., F.L.S. Thacker, Spink & Co., Calcutta. Third Edition, 1904. Price, Rs. 18. Pp. 704, and 50 Illustrations.

THAT India forms a fruitful field for medico-legal observations is somewhat a trite saying to those who know the country, and is obviously proved by the rich storehouses of facts accumulated in the numerous series of reports, papers, and text-books dealing with Medical Jurisprudence in India. In France the names of Orfila and Tardieu have been held in great repute. Chevers in India corresponds to Christison of Scotland as teacher and authority in this subject. Just as Taylor's text-book has for long been a standard work of reference, so it would seem from the excellence of its contents the third edition of *Lyon's Medical Jurisprudence* will prove the same for India. The first edition of this work was published in 1888, and was followed by a second in little over a year. After a long interval, and long after it was urgently needed, the new edition has at last been issued. We happen to have a copy of the second edition by us. In size and appearance there is not much to choose between them, so skilfully has Lieutenant-Colonel Waddell, I.M.S., managed to adapt himself to the requirements of space by the use of various types, by condensing, excising and re-writing. The last two editions are almost different books, and we must confess to a preference for the one under review. As Chemical Examiner to the Governments of Bengal and India, the author had splendid opportunities of which he has made good use, maintaining in Calcutta the high standard earned by the work and writings of predecessors such as Chevers, Harvey, McLeod, and Coull Mackenzie.

After a useful introductory chapter on the relations of the medical man with the law courts, the author proceeds to divide the book into three parts dealing with (1) the general examination of the dead and the living; (2) with special injuries and offences of a non-sexual and a sexual character, also with insanity and life assurance; (3) with toxicology. Throughout the text are scattered about three hundred carefully selected illustrative cases. In addition there is much of practical interest in the appendices, and to an excellent index there is added a list of the vernacular names of plants and drugs. In the first section special reference is made to the racial and caste differences of structure, height and weight of the Indian peoples, and to the dates for dentition, menstruation, formation of adipocere, and many other points regarded purely from facts observed in India, and not merely adapted from the conditions recorded in Europe. The various homicidal and suicidal methods common to India, and crimes of a sexual nature most prevalent in the country, are ably dealt with. Under poisons there are excellent sections dealing with arsenic, aconite, mercury, pounded glass, marking-nuts, madar, oleander, jequirity, datura, cannabis indica and nux vomica.

The third edition of this work can be confidently recommended as a text-book and book of reference on Indian Medical Jurisprudence to both students and medical officers in India, and it will doubtless often be called in evidence by members of the long robe practising in the law courts.

The Nutrition of the Infant.—By R. VINCENT, M.D. Baillière, Tindall & Cox, London, 1904. Demy 8vo. Pp. 313. Price, 10*s.* 6*d.*

THE subject of infant-feeding is of vital importance, and this book is a notable attempt to bring our traditional, rather haphazard, empirical methods to a more rational practice based on modern analytical and clinical knowledge. Given the specific gravity and percentage of fat in a sample of human milk, the following general deductions may be made:—

(1) If both the percentage of fat and the specific gravity are high, we may assume the albuminoids are present in large amount, otherwise the excess of fat would reduce the specific gravity below normal. (2) If the percentage of fat is low and the specific gravity is high, the albuminoids are probably normal in quantity. (3) If the percentage of fat is high and specific gravity low, the albuminoids are probably normal. (4) If both the fat percentage and the specific gravity are low, the albuminoids are probably below normal. To arrive at the composition of

normal human milk, not an easy task since milk varies considerably in different women and in the same woman from week to week, the author has collected the most important and recent analyses made by reliable observers, such as Schlossmann, Rotch, Carter and Richmond, Söldner, Adriance, Harrington and Kinnicutt. In the author's opinion the composition of human milk in the fourth week of lactation is approximately as follows:—Fat, 4; lactose, 7; whey proteids, 1; caseinogen, 0·40; nitrogenous extractives, 0·60; mineral salts, 0·25; and water, 86·75. This he adopts as his standard for substitute feeding, and consequently finds serious objection to the popular practice of diluting cow's milk with water for infants' foods. Experimentally it has been found that a close correspondence exists between the mother's milk and the digestive needs of her infant. Fourteen quite different analyses are given of cases in which the mothers successfully nursed their infants, and in which an interchange of infants promptly produced gastro-intestinal troubles.

Numerous contra-indications to mothers nursing their offspring are detailed, and the author is impressed by the increasing inability of women to nurse their infants owing to the effects of modern life. At the same time a common-sense diet, regular exercise, and a methodical life will enable many a woman to nurse successfully who is supposed to be unable to do so. By experimenting with totally different diets, it has been found on analysis that fat was the only ingredient of the milk on which diet produced any appreciable effect. Neither an abundant supply of carbo-hydrates nor an increased amount of fat augmented the fat in the milk, and increase of fluids or excess of salted foods made scarcely any appreciable alteration. The routine administration of alcohol to nursing mothers is deprecated, since alcohol is of no value in regard to lactation itself. Exercise is much better. Stress is laid on the fact that too frequently the infant is dosed with grey powder, castor-oil, and various mixtures, on the supposition that the infant's digestion is at fault, whereas the real cause is left untouched, *i.e.*, the faulty condition of the mother's milk. The custom of "mixed feeding" in cases where the mother cannot give a sufficient supply of milk to her child does not meet with the author's approval, since the partial failure of the mammary glands indicates exhaustion.

Cow's milk, we learn from an average of 200,000 analyses, is composed as follows:—Fat, 3·90; lactose, 4·75; caseinogen, 3·00; albumin, 0·40; ash, 0·75; and water, 87·10. The differences of composition in various breeds are given, and we are told that cow's milk has variations just like human milk. Just as nervous influences affect woman's milk, so the milk of cows exhibited at agricultural shows is markedly altered, especially as regards the proportion of total solids and the fat is markedly reduced. There are seasonal variations in cow's milk, which is rich in fat and other solid constituents during November, December and January. In February, March and April there is less fat, but the other solids are not appreciably diminished. From May to August there is still less fat, and during July and August the other solids decrease. In September and October the milk gradually increases in richness to the standard of the winter months. There is also a diurnal variation, the evening milk being richer in all the solids than that of the morning. Cow's milk differs also in solids according as it is the milk from full udders or from a nearly empty gland. The practical outcome of the marked difference between human and cow's milk is that whey is much better than water in the substitute-feeding of infants, 5 per cent. of lime-water suffices for the alkalinity, the amount of fat in both human and cow's milk is nearly the same, there is less lactose in the latter, and acids cause much more bulky curds in cow's milk; in human milk the curd is small and flocculent.

By substitute-feeding the author means either wet-nursing or feeding by modified cow's milk, and he favours the latter as being more accurate and adaptable to all cases. By artificial feeding he means those methods in which food mixtures are derived from products artificially prepared by manufacturers, and this practice he condones only in instances of temporary emergency, where neither natural nursing nor any form of substitute feeding is available. Rotch, of Boston, is the great exponent of laboratory methods of preparing milk for infant feeding. He uses standardized creams containing known percentages of fat, separated milk, whey, lactose, distilled, water and lime-water. When required, pepsin rennin, sodium chloride, and various cereals are added.

The milk prescription should specify the percentage of fat, lactose, proteids, and alkalinity required, the number of feeds and the amount of each, whether it should be heated, and if so, the temperature. The following prescriptions are the first and last of a series of twenty given in full detail:—

I.

	Per cent.		
Fat ...	1·00	32 % cream ...	½ oz.
Lactose ...	5·00	20 % solution ...	3 „
Whey proteids	0·50	Whey ...	8½ „
Caseinogen	0·15	Fat-free milk ...	¾ „
Alkalinity	5·00	Lime-water ...	1 „
		Distilled water ...	6¼ „
			20 oz.

XX.

Fat ...	4·00	16 % cream ...	5 oz.
Lactose ...	7·00	20 % solution ...	4¼ „
Proteids ...	2·00	Fat-free milk ...	5½ „
Alkalinity	5·00	Lime-water ...	1 „
		Distilled water ...	3¾ „
			20 oz.

The main objections are the cost of preparation, transport and delivery, which must necessarily restrict this method to the well-to-do and to

hospital use; also it implies that the prescriber is familiar with the subject, and prescribes correctly for the needs of each case and does not adopt a routine procedure for all and sundry. Unfortunately only a small percentage of general practitioners are enthusiasts in infant feeding, or take the necessary trouble to acquire a working knowledge of rational and exact methods.

We have dealt with only four chapters of this excellent work, and we regret that space does not permit of a *résumé* of the chapters on artificial feeding, milk-supply, the changes which result from heating milk, the bacteriology of milk, the chemistry of infantile digestion, and various other subjects, treating of the diet and development of the infant, and morbid conditions, such as marasmus, scurvy and rickets. Anyone desirous of bringing his knowledge of infant-feeding abreast of the latest developments in modern theory and practice will not regret a careful perusal of Dr. Vincent's book.

The Sterilisation of Urethral Instruments.—By HERBERT T. HERRING, M.C., B.S. (Durham), M.R.C.S. H. K. Lewis, London. Pages XVII & 176. Size demy 8vo. Price 5*s*.

THE sterilisation of catheters, bougies, etc., is often not carried out so thoroughly as is the case with other surgical instruments; much more so is it when a patient has to prepare an instrument to pass upon himself. The author in this book details the instructions which he is in the habit of giving to such patients.

Chapter I deals with the various kinds of catheters and bougies.

Chapter II with their sterilisation by boiling water with a layer of liquid vaseline on the surface, so that on withdrawal of the instrument from the steriliser it is uniformly lubricated with an aseptic lubricant and ready for use. The author has designed a simple apparatus for the use of patients who require catheterism at frequent intervals by which twelve catheters can be prepared in 20 minutes and kept aseptic; this saves a considerable amount of time and trouble. The apparatus appears to be extremely good.

Chapter III includes the preparation of the parts before catheterism, and Chapter V the methods of passing the different varieties of catheters and bougies. The remaining chapters describe the symptoms of "residual urine" before and after microbic infection with the treatment, so far as it concerns simple remedies and similarly with stricture; these chapters are added because the author believes that a patient will carry out instructions more thoroughly if he understands the reasons thereof; if so full an account as there is in this book should always be given to the patient, is, however, a matter of opinion. Reference is also made to operation in retention of urine from enlarged prostate; the author holds that in many cases the prevention of infection of the urine by the passage of sterile instruments does away with the necessity of operation; from the scope of the book these remarks seem unnecessary. Urethral and bladder injections are also described.

In conclusion if any one is in need of a list of instructions to give a patient who has to pass an instrument for himself, he will find it in this book. The author seems unduly optimistic as regards the proportion of patients who will carry out sterilisation efficiently; certainly a large proportion of English hospital patients will probably fail, and how much more so in this country.

EXTRACTS FROM MEDICAL JOURNALS.

PATHOLOGY AND BACTERIOLOGY.

Reports of the Sleeping Sickness Commission of the Royal Society.—The four numbers of these reports, containing eight papers, which have been recently issued, throw great light on this hitherto obscure disease, as well as on the African human trypanosoma fever, so they are of great interest to workers in India from more than one point of view. The first point to be decided was the correctness or otherwise of the suggestion of Manson that the disease is due to the filaria perstans, and this part of the inquiry was entrusted especially to Dr. C. Christy, who made several extensive journeys in different directions through Uganda and eventually down the Nile valley, and examined very large numbers of slides for filaria. In his first report he was able to show that the areas of sleeping sickness and of filaria perstans in no way corresponded, and this important observation was confirmed and extended by his further experience. Thus sleeping sickness is only found in Uganda within 30 or 40 miles of the Lake Victoria Y Nyansa, while it is only met with in its most intense and wide-spread form in the immediate vicinity of the lake. Further sleeping sickness has recently extended down the east side of the lake into an area which is quite free from filaria perstans. Again the area of filaria perstans extends much further to the north of the lake than does sleeping sickness, and this parasite was found in largest numbers outside the sleeping sickness area. Dr. Christy also made a collection of mosquitos, but was unable to find any whose distribution agreed closely with that of sleeping sickness, while his report also contains much information on the distribution and course of the disease.

The clinical aspects of the disease were more especially studied by Low and Castellani, who give an interesting account of the affection in their report, only the main points of which can here be dealt with. Sleeping sickness was first found in Uganda by Cook in 1900, since which it has spread steadily round the north side of the lake. The symptoms begin insidiously, the patient becoming dull and lethargic and slow of speech. Headaches, a fine tremor of the tongue, a rapid and soft pulse, an evening rise of temperature to 101° or 102° F., falling to subnormal in the morning, being noted. The drowsiness, which is at first intermittent, becomes more marked, emaciation and weakness set in, and the case terminates with coma and a subnormal temperature, invariably ending fatally after either a rapid acute or a slow chronic course. The leucocyte formula is mononeuclear, anæmia of a comparatively slight degree is constant, and malarial parasites and pigmented leucocytes indicating malarial complications, are frequently met with, while the spleen is always enlarged and hard. After death a chronic meningo-encepalitis and a meningo-myelitis is found, with excess of pale straw coloured sub-arachnoid fluid, but the brain substance is firm and normal in appearance. Treatment is purely palliative.

The bacteriological part of the work of the First Commission was carried out by Dr. Castellani, who grew a streptococcus from the blood of the heart in 32 out of 39 cases, and from the liquid of the lateral ventricles in 30 of them. During life he found the germ very rarely, and only in the last stages of the disease, it only having been grown once from the blood of a vein out of 37 cases repeatedly examined. He also obtained it by lumber puncture in 5 out of 28 cases, but only a few hours before death with one exception. While centrifuging cerebro-spinal fluid to search for the streptococcus he came across the trypanosoma, and at the time of the arrival of the Second Commission, with Colonel Bruce at its head, Dr. Castellani had found the trypanosoma in five cases in the cerebro-spinal fluid and once also in the blood. Work was immediately commenced to confirm this observation, and before Dr. Castellani left for England 34 cases of sleeping sickness and 12 controls had been examined, with a positive result in 70 per cent. of the former, and a negative result in the latter. The foregoing is Colonel Bruce's account of the work, as we do not propose to enter into the very unfortunate controversy as to the relative merits of the work of the different observers.

The remaining reports are a progress report by Colonel Bruce and D. D. Nabarro, and a further report by the same authors in conjunction with Captain E. D. W. Greig, who it will be remembered was sent to Uganda to study sleeping sickness by the Government of India. These are of great interest as they confirm and greatly extend Castellani's discovery of the trypanosoma, and also throw a very important light on human trypanosoma fever. As the full later report includes the main points established in the progress one, it will be sufficient to follow briefly the former, which is very clearly arranged, so as to bring out the salient features.

In the first place the trypanosoma was found in every one of forty cases of the disease in the cerebro-spinal fluid, usually in very small numbers, and this is also true of cases occurring in Kavirondo, where practically no filariæ are found in the blood. Secondly, in 22 cases of diseases other than sleeping sickness no trypanosoma were found in the cerebro-spinal fluid. Further in practically all cases in sleeping sickness the trypanosoma was also found in the blood, which led on to the important question: Has the so-called trypanosoma fever any connection with sleeping sickness? Trypanosoma fever as seen in West Africa appears to cause little or no inconvenience to those harbouring the parasite and never to be fatal in itself (in marked contrast to Kala-Azar, which Manson has recently suggested may be trypanosoma fever), while sleeping sickness is invariably fatal. The authors, however, record two cases of trypanosoma being found in the blood, while absent from the cerebro-spinal fluid, with little or no symptoms, but in which at a later date the parasites appeared in the cerebro-spinal fluid coincidently with a rise in temperature and symptoms suggestive of an early stage of sleeping sickness, strongly suggesting a relationship between the two diseases. In order to test the question further a number of healthy people both within and without the sleeping sickness area were examined, and 27·7 per cent. of 80 natives within the sleeping sickness area were found to have the trypanosoma in their blood, while of 117 natives from the non-sleeping sickness areas none were infected. Further no microscopical differences could be found in the trypanosomes from the blood and from the cerebro-spinal fluid when they were injected into monkeys. They were injected into various animals, and especially into monkeys and the effects watched. The results were most instructive for typical sleeping sickness was produced in monkeys with the trypanosoma in the spinal fluid, by subcutaneous injections of both cerebro-spinal fluid from a case of sleeping sickness and by the blood of a case of trypanosoma fever without any symptoms of sleeping sickness, both proving fatal and showing the usual *post-mortem* signs of sleeping sickness and no other disease. This very strongly supports the suggestion of the authors that trypanosoma fever and sleeping sickness are but different stages of one and the same disease, the more serious affection ensuing when the parasites make their way from the blood stream into the cerebro-spinal fluid. If this is the case, then we may be pretty certain that the African form of trypanosoma fever does not exist in India, as sleeping sickness is not a disease which could have been well overlooked in this country, although this will not preclude the possibility of other forms of trypanosoma fever occurring here due to a different species of the parasite. Next, search was made for the tsetse fly, and a species named the Glossina palpalis was soon found in large numbers around the margin of the lake more especially, and with the aid of the native chiefs collections of flies from various parts of Uganda were made, with the result that the distribution of this fly was found to correspond closely with the distribution of sleeping sickness. Lastly, tsetse flies were caught and allowed to bite monkeys after having been fed on sleeping sickness patients at various intervals before, and the infection was conveyed to these animals up to forty-eight hours after they had been fed on the infected patients' blood; and further, freshly caught flies when allowed to bite monkeys also produced the infection in them, proving that they were naturally infected. In short the authors conclude that sleeping sickness is a *human tsetse fly disease.*

L. R.

Correspondence.

CÆSARIAN SECTION.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—In regard to the case of Cæsarian Section recorded on page 18 of the January number of the *Indian Medical Gazette*, it would be instructive to know; Why Capt. Stodart tried to do version at all in this case, and when this failed what decided him on choosing Cæsarian Section; an operation of which the risk in this class of case is known to be very high and when the child's life was not even in question, as against decapitation or embryotomy. Also why Captain Stodart tore through the placenta instead of cutting it or pushing it aside. Again what was his object in injecting ergotine before operation? In conclusion I infer the strength 1 in 2,000 given as that of the perchloride of mercury lotion used, was a printer's error for a much weaker solution.

ENQUIRER.

CÆSARIAN SECTION.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I have read with great surprise the notes of Captain J. Stodart's case of Cæsarian Section which have been published in the *Indian Medical Gazette* of January 1904. To perform Cæsarian section for a case of transverse presentation is to say the least, very unusual. But before coming to any conclusion on the subject I should like to be enlightened on some points.

1. What was the cause of her exhaustion?
2. Had the pains really ceased or was the uterus in a state of tonic contraction? Is not that the usual condition met with in cases like those of Captain Stodart's?
3. What is meant by inelasticity and want of dilatation of the parts? If there were no pains why were the parts—if by that he means the cervix only—inelastic? If he means vagina as well, surely after 16 hours of labour, the vagina of a woman of 30 is big enough for all purposes?
4. Was there any contraction of the pelvis?
5. Was chloroform administered while attempts at version were made?
6. Why did the operator try to return the prolapsed arm? Does not a prolapsed arm go up of itself when the leg is pulled down?
7. What exact procedure was followed during the fruitless attempts at version?
8. Was the child dead when the patient was admitted? If so, is it not the usual practice to perform decapitation especially so when the shoulder is jammed in the pelvis—as was the condition in the present case?
9. What were the reasons which justified Captain Stodart in performing such a serious operation as Cæsarian section, and not an operation for breaking up the child?

OBSTETRICS.

"CIRCUMCISION; MIDWIVES AND 'THE MINOR OPERATION.'"

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—In the *Indian Medical Gazette* for January there appeared a letter from a correspondent signing himself 'Surgeon' under the above heading. I do not know whether the hospital therein referred to is the Eden Hospital, Calcutta, or no. At all events the treatment he is in such a hurry to condemn (apparently entirely on theoretical grounds) is systematically taught and carried out here and is regarded by those responsible for the working of the hospital as most necessary and valuable. To begin with 'Surgeon' is guilty of gross exaggeration, to put it mildly, when he talks of twenty minutes to half an hour's hard struggle, etc. It is very rarely the case that any real difficulty is experienced in performing this small so-called operation, and if there should be any, the nurse is taught to at once desist and inform the doctor of the matter. I do not think if 'Surgeon' had had much practical experience in this matter he would have written as he has done. To take his considerations *seriatim*.

1. Absence of proof, etc. Of course until a large number of statistics could be collected, this would be impossible to be proved one way or the other, but I can tell 'Surgeon' that in talking the matter over with a former Resident of this institution he told me of two cases in which the precaution had through an error not been adopted, and in both these cases there was considerable trouble afterwards, and both ultimately had to be circumcised, and he has only to see the state of the glans penis in some children attending the out-patient department of hospitals for troubles connected with this organ, and the collection of dirt and dried smegma behind the prepuce, setting up balanitis and such like troubles, and also cases of phimosis due to adhesions between the prepuce and glans, to feel that had the minor operation been performed in these cases they would never have come to this pass.

2. The futility and unscientific nature of the proceeding. Here, again, I venture to say 'Surgeon' shows his lack of practical experience. Has he never seen cases of phimosis in children, and severe ones too, cured by simple retraction of the prepuce and cleaning of the glans carried out daily for a week or so? I state most emphatically that if properly stretched the prepuce does not contract again. Personally I have never seen tears result from the performance of the minor operation, and certainly they could only occur from gross carelessness, and any treatment becames unscientific if not properly carried out.

3. The objection to training midwives to perform this little operation. This argument is really too silly to require answering. It would be just as reasonable to object to teaching midwives to tie the cord of the new-born child.

4. Rarity of the necessity for circumcision. This is quite true, but is there such a rarity of balanitis, phimosis and the lesser evils which I maintain are at least to a large degree prevented by this operation? I think if 'Surgeon' had seen the minor operation performed in many new-born children he would be surprised at the number of cases with adhesions between the glans and prepuce which are easily broken down at this time, but which if left, would be almost sure to give rise to trouble in the future.

5. It cannot prevent or relieve difficulty of micturition. This again I deny. Has 'Surgeon' never seen the ballooning of the prepuce, during micturition, in a baby, due to a small preputial orifice? This can generally be completely cured by gently stretching or retracting the foreskin. Of course I do not deny that in a few cases with a very minute preputial orifice something further may be necessary.

In conclusion I may say that I have never seen a child troubled with phimosis or balanitis who has had this so-called 'minor' operation properly performed on him, but I have seen many cases occurring in those who have not been so treated.

Personally I believe that, properly carried out, it is of the greatest use and an immense safeguard against future troubles.

J. C. HOLDICH LEICESTER,
Resident Surgeon, Eden Hospital.

DELHI BOIL.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I have received a letter from Mons. Mesnil of the Institut Pasteur, Paris, to the effect that a protozoan very like Piroplasma Donovani, Laveran and Mesnil, has been found in tropical ulcer.

I give Mons. Mesnil's words in original:—"Un Americain, J. H. Wright, vient de décrire (*The Journal of Medical Research*, November 1903. *Journal of Cutaneous Diseases*, January, 1904. dans les frottés des coupes du bouton d'Alps (tropical ulcer—Aleppo boil) un Protozoaire ressemblant extrêmement au Piroplasma Donovani. Ce Protozoaire est très abondant dans les cellules qui constituent l'infiltration du bouton."

I hope those of your readers who have cases of Delhi boil will make an examination of the tissues and communicate the results.

C. DONOVAN,
Major, I. M. S.,
2nd Physcn., Genl. Hosptl.,
Madras.

February 2nd, 1904.

DELHI BOIL.

To the Editor, "INDIAN MEDICAL GAZETTE."

SIR,—Since sending in my letter to you anent "Delhi Boil," I have found Piroplasma Donovani, in scrapings from small ulcers on the knee of a case suffering from piroplasmosis. The ulcers were caused most probably by the itch acarus (Sarcoptes scabiei), anyway the patient was covered with itch. This skin affection with small ulcers I have noticed on several of my cases infected with piroplasma. Is the sarcoptes an intermediary host? Dr. J. H. Wright, of Boston, has very kindly sent me a reprint of his article "Protozoa in case of Tropical Ulcer (Delhi Boil)" in the *Journal of Medical Research* for December 1903, and the plates there in depict organisms identical with mine.

C. DONOVAN,
Major, I. M. S.,
2nd Physcn., Genl. Hosptl.,
Madras.

February 15th 1904.

Service Notes.

SURGEONS WHO HAVE WON THE VICTORIA CROSS.*

COMPILED BY G. F. BLAKE,
Registrar of the Royal College of Surgeons in Ireland.

THE Victoria Cross was instituted by Royal Warrant, Jan. 29th, 1856. It is provided that not rank, or long service, or wounds, or any other circumstances whatever, save the merit of conspicuous bravery or devotion to the country in the presence of the enemy, shall be held to establish a sufficient claim to the honour. Since its institution less than 500 crosses have been conferred, 26 of which have been awarded to surgeons. The following notes show how each of these 26 distinguished members of the medical profession obtained the coveted decoration:—

William Babtie, Major, now Lieutenant-Colonel, R.A.M.C., C.M.G., M.B., (Glasg.) 1880, L.R.C.P. & S. (Edin.) 1880, was awarded the Victoria Cross for going out and attending wounded exposed to heavy fire and afterwards going out, also under heavy fire, and bringing in Lieutenant Roberts who was lying wounded on the veldt. "Colenso, South Africa," 1899.

William Bradshaw, deceased, Assistant Surgeon, 90th Regiment, L.R.C.S., (Irel.) 1854, was awarded the Victoria Cross for gallantly defending the wounded left under his charge and was himself wounded. "Lucknow, Indian Mutiny," 1857.

Thomas Joseph Crean, Surgeon-Captain, 1st Imperial Light Horse, now Captain, R.A.M.C., L.R.C.P. & S. (Irel.) 1896, M.O.N. F.R.C.S. (Irel.) 1902, was awarded the Victoria Cross for conspicuous gallantry in continuing to attend wounded in the firing line under heavy fire at 150 yards range when he was himself wounded, and only desisted when he was hit a second time. "Tygerskloof, South Africa," 1901.

John Crimmin, Surgeon, now Lieutenant-Colonel, I.M.S., C.I.E., L.R.C.P. (Irel.) 1882, L.R.C.S. Irel. 1879, was awarded the Victoria Cross for attending wounded actually within the enemy's fighting line, and had at one time to leave his charge and to fight hand to hand against heavy odds, killing one man with his sword. When help arrived the enemy were driven off. "Burma, India," 1889.

Campbell Mills Douglas, Assistant Surgeon, 24th Regiment, now Brigade-Surgeon, A.M.D. (retired), M.D. (Edin.) 1861, L.R.C.S. (Edin.) 1861, Silver Medal Royal Humane Society for saving life at sea, was awarded the Victoria Cross for his gallant and daring manner in taking boat through dangerous sea and rescuing 17 officers and soldiers. "Little Andaman Island," 1867.

Henry Edward Manning Douglas, Lieutenant, now Captain, R.A.M.C., D.S.O., L.R.C.P. (Edin.) 1898, L.F.P. & S. (Glasg.) 1898, was awarded the Victoria Cross for having shown great gallantry and devotion under severe fire in the open in attending a wounded officer and on the same day attending another wounded officer and men under a fearful fire. "Magersfontein, South Africa," 1899.

Thomas Egerton Hale, Assistant Surgeon, 7th Regiment, now Surgeon-Major, A.M.D. (retired), J.P., M.D. (St. And.) 1856, M.R.C.S. (Eng.) 1854, was awarded the Victoria Cross for remaining with a wounded officer and bringing in wounded under fire. "Sebastopol, Crimean War," 1855.

Edmund Baron Hartley, Surgeon-Major, Cape Mounted Rifles, now Surgeon-Lieutenant Colonel, Colonial Forces, Cape Colony, C.M.G., L.R.C.P., (Edin.) 1880 M.R.C.S. (Eng.) 1874, was awarded the Victoria Cross for attending and carrying wounded to a place of safety under fire. "Basutoland, South Africa," 1879.

* Reprinted from *The Lancet*, 9th January, 1904.

Anthony Dickson Home, Surgeon, 90th Regiment, afterwards Surgeon-General, A.M.D. (retired), K.C.B., M.D. (St. And.) 1847, was awarded the Victoria Cross for persevering bravery and admirable conduct in defending the wounded left under his charge. "Lucknow, Indian Mutiny," 1857.

Neville Reginald Howse, Captain, New South Wales Medical Staff Corps, L.R.C.P. (Lond.), 1887; M. 1886, F. 1897, M.R.C.S. (Eng.), was awarded the Victoria Cross for going out under a heavy cross fire and carrying a wounded man to a place of safety. "Vredefort, South Africa," 1900.

Edgar Thomas Inkson, Lieutenant, now Captain, R.A.M.C., L.R.C.P. (Lond.), 1898, M.R.C.S. (Eng.), 1898, was awarded the Victoria Cross for having carried a wounded officer over exposed ground to a place of safety under heavy fire. "Tugela, South Africa," 1900.

Joseph Jee, deceased, Surgeon, 78th Regiment, afterwards Deputy Inspector-General, A.M.D., C.B., M.R.C.S. (Eng.), 1841, winner of the Grand Prix du Casino, Monte Carlo, 1873, was awarded the Victoria Cross for gallantry in attending, protecting, and saving a number of wounded. "Lucknow, Indian Mutiny," 1857.

Ferdinand Simeon Le Quesne, Surgeon, A.M.D., now Major, R.A.M.C., L.R.C.P. (Lond.), 1886, M.R.C.S., (Eng.), 1886, L.S.A. (Lond.), 1885, was awarded the Victoria Cross for attending a wounded officer in front of the enemy's loopholes and attending another officer under heavy fire when he was himself wounded. "Burma, India," 1889.

Owen Edward Pennefather Lloyd, Major, A.M.D., now Lieutenant-Colonel, R.A.M.C., L.R.C.P. (Edin.), 1877, L.R.C.S. (Edin.), 1877, was awarded the Victoria Cross for conspicuous bravery in going to rescue a wounded officer under heavy fire. "Kachin Expedition, India," 1894.

John Frederick McCrea, deceased, Surgeon, Cape Mounted Police, M.R.C.S. (Eng.), 1878, L.R.C.P., (Edin.) 1878, was awarded the Victoria Cross for attending wounded under heavy fire, although himself wounded, and carrying wounded to a place of safety under fire. "Transvaal War, South Africa," 1881.

Valentine Munbee McMaster, deceased, Assistant Surgeon, 78th Regiment, M.R.C.S. (Edin.), 1855, M.D. (Univ. Edin)., 1860, was awarded the Victoria Cross for attending to, and bringing in, wounded under a heavy fire and was himself wounded. "Lucknow, Indian Mutiny," 1857.

William Job Maillard, deceased, Staff Surgeon, Royal Navy, M.B., 1888, M.D. 1891 (Lond. Univ.), M.R.C.P. (Lond.), 1888, M.R.C.S. (Eng.), 1888, was awarded the Victoria Cross for going through a perfect hail of bullets and endeavouring to rescue a wounded seaman of H. M. S. *Hazard*. "Island of Crete," 1898.

William George Nicholas Manley, deceased, Assistant Surgeon, Royal Artillery, afterwards Surgeon-General, A.M.D., C.B., M.R.C.S. (Eng.), 1852, Bronze Medal of Royal Humane Society for saving life at sea, was awarded the Victoria Cross for risking his life to save Commander Hay, R. N. "Maori War, New Zealand," 1864.

Arthur Martin-Leake, Surgeon-Captain, South African Constabulary, L.R.C.P. (Lond.), 1898, M.R.C.S. (Eng.), 1898, was awarded the Victoria Cross for attending a wounded man under a heavy fire at 100 yards' range and assisting a wounded officer to a place of safety when he was himself shot three times. "Vlakfontein, South Africa," 1901.

James Mouat, deceased, Surgeon, 6th Inniskilling Dragoons, afterwards Surgeon-General, K.C.B., Knight of the Legion of Honour, M. 1837, F. 1852, R.C.S. (Eng.), was awarded the Victoria Cross for rescuing wounded officer from exposed situation and binding his wounds in the presence of the enemy. "Balaklava, Crimean War," 1854.

William Henry Snyder Nickerson, Lieutenant, now Captain, R.A.M.C., M.B., B.Ch. 1896, Victoria University, Manchester, was awarded the Victoria Cross for going out and attending wounded man under a heavy rifle and shell fire, dressing his wounds and remaining with him till he was removed to a place of safety. "Wakkerstroom, South Africa," 1900.

Herbert Taylor Reade, deceased, Surgeon, 61st Regiment, afterwards Surgeon-General, A.M.D., C.B., M.R.C.S. (Eng.), 1849, was awarded the Victoria Cross for gallantry in dislodging with small force party of rebels firing on wounded. "Delhi, Indian Mutiny," 1857.

James Henry Reynolds, Surgeon-Major, now Lieutenant-Colonel, A.M.D. (retired), M.B., M.Ch. (Univ. Dub.), 1867. HON. F.R.C.P. (Irel.) 1879, was awarded the Victoria Cross for conspicuous bravery in attending the wounded under fire and defence of hospital. "Rorke's Drift, Zululand, South Africa," 1879.

Henry Thomas Sylvester, Assistant Surgeon, 23rd Regiment (retired) Knight of the Legion of Honour, M.D. (Aberdeen) 1855, L.R.C.S. (Edin.), 1853, L.S.A., 1869, was awarded the Victoria Cross for going out to a wounded officer and attending wounded under heavy fire. "Sebastopol, Crimean War," 1855.

William Temple, Assistant Surgeon, Royal Artillery, now Brigade Surgeon, A.M.D. (retired), M.B. (Univ. Dub.), 1858, L.R.C.S. (Irel.), 1858, was awarded the Victoria Cross for gallant conduct and devotion in assisting wounded under heavy fire. "Maori War, New Zealand," 1864.

Harry Frederick Whitchurch, Surgeon Captain, now Major, I.M.S., L.R.C.P. (Lond.) 1887, M.R.C.S., (Eng.) 1887, was awarded the Victoria Cross for rescuing a wounded officer when the troops with which he was fell back, having to proceed over a mile under the enemy's fire. "Chitral, India," 1895.

THE NEW I. M. S. REGULATIONS.—Commenting on the adverse conditions which still exist unremedied in the civil branch of the I. M. S., a writer in *The Lancet* for the 9th January remarks as follows:—

"It is true that before the introduction of the new rates of pay the pay of a second class civil surgeoncy was Rs. 50 less per mensem, than that of an officer in permanent charge of a regiment, yet this is not now the case, as I know from experience. The pay remains the same as before and is consequently now Rs. 100 a month less than that for permanent charge of a native regiment. * * * It is very rare for any civil surgeon of a second class station to make anything approaching this sum (Rs. 100) in private practice; 30 to 50 rupees a month would give a fair average of the takings from private practice."

REGULATIONS FOR THE ENTRY OF SURGEONS FOR TEMPORARY SERVICE IN THE MEDICAL DEPARTMENT OF THE ROYAL NAVY.

SURGEONS who may be temporarily employed in the Royal Navy to meet the requirements of the Service will be appointed under the following regulations:—

QUALIFICATIONS.

To be registered under the Medical Act as qualified to practise Medicine and Surgery in Great Britain and Ireland.

To produce certificates of good character.

To be reported physically fit after medical examination.

Age not to exceed 40 years.

PAY AND ALLOWANCES.

Full Pay.		Half Pay.	
A day.	A year.	A day.	A year.
22*s.* 0*d.*	£401 10*s.* 0*d.*	10*s.*	£182 10*s.* 0*d.*

Note.—Half pay is for sickness and extra leave only.

To be granted 30 days' advance of pay on joining a ship after appointment.

To receive the same allowances as are payable to permanent officers of their rank.

Lodging money at the rate of £50 a year is usually allowed when employed on shore without Quarters in the United Kingdom, and £24 year in lieu of rations. In cases however of temporay employment on shore, the lodging and provision allowances will be at the rate of 3*s.* 6*d.* and 1*s.* 6*d.* per day respectively.

If Quarters are provided in a Medical Establishment, an allowance is granted in lieu of provisions, for self and servant, and for fuel and lights at the rate of £39 a year in the United Kingdom, and £108 a year abroad.

UNIFORM.

Each Surgeon to provide himself as follows:—

(1) Frock coat, waistcoat and trousers.
(2) Undress coat.
(3) Uniform cap.
(4) Mess jacket and waistcoat.
(5) Sword and undress belt.

All as specified in the Uniform Regulations.

To cover the above each officer accepted for service will receive an Equipment Allowance £20 (payable on the officers being called up for active service).

The following instruments must be provided by the Surgeon:—

A pocket case of instruments.
A Stethoscope.
Three Clinical Thermometers.

MESSING.

Surgeons will be allowed, when attached to ships in commission, the ordinary ship's rations; but will have to pay about 2*s.* a day towards the maintenance of their mess as Ward-room Officers.

PENSIONS FOR WOUNDS AND TO WIDOWS, &c.*

In the event of Surgeons engaged for temporary service being wounded in His Majesty's Service, Gratuities or Pensions, varying in amount according to the injuries sustained, will be granted, on the basis of the awards in similar cases of Naval Officers.

Should Temporary Service Surgeons be killed in action, die within six months of wounds received in action, or meet their death by acts of the enemy, the following Pensions and Allowances will be granted to their widows, children, &c.:—

* Unmarried candidates will be preferred.

	Widows.		Children up to the age of 18 for Boys, and 21 for Girls.		Widowed Mothers dependent on their Sons, if the latter left no Widows or Children.	Orphan Sisters dependent on their Brothers, if the latter left no Mothers, Widows, or Children.
	Killed in Action.	Drowned, &c., by Acts of the Enemy.	Killed in Action.	Drowned, &c., by Acts of the Enemy.	Killed or drowned, or suffered Violent Death by Acts of the Enemy.	Killed or drowned, or suffered Violent Death by Acts of the Enemy.
Surgeon..	£ 80	£ 65	£ 12 to 16	£ 10 to 14	£ 50	£ 50

In addition to the foregoing pensions, the widows and children of officers killed in action will be granted the following Gratuities:

Widows—One year's pay of their husband's corresponding rank in the Royal Navy.

Each unmarried child, under the age of 21, one-third of the Gratuity paid to the widow.

These Pensions and Gratuities can be given only in cases of injury or death caused by acts of the enemy, and not on account of injury, disability or death, which may result from carrying on the ordinary duties of the Service.

CONDITIONS OF SERVICE.

To engage for six months certain, but the liability to serve will be limited to five years.

To serve when and where required from the date of signing the Declaration.

To be liable to immediate discharge for misconduct or incompetency.

To rank with, but after, Surgeons in the permanent service

To be under the general rules of the Service as regards discipline, &c.

To receive two calendar months' notice of services being no longer required.

To be granted a gratuity of two calendar months' pay on discharge, if not discharged for misconduct or incompetency.

Voluntary resignation of appointment will be allowed subject to the convenience of the Service, but the gratuity of two calendar months' pay on discharge will be thereby forfeited.

Any persons desirous of registering their names for such service should communicate direct with—

The Secretary to
His Excellency the Naval Commander-in-Chief,
c/o Assistant Paymaster-in-charge,
Royal Naval Depôt,
Bombay.

MAJOR J. R. ROBERTS, I.M.S., is appointed to officiate as an Agency Surgeon of the 1st class, and as Administrative Medical Officer in Central India.

CAPTAIN N. R. J. RAINIER, I.M.S., has been granted an extension of three months' leave on medical certificate.

CAPTAIN T. H. DELANY, I.M.S., is appointed to act as Civil Surgeon of Jessore.

CAPTAIN V. E. H. LINDESAY, I.M.S., is appointed to act as Civil Surgeon of Tippera.

MAJOR U. N. MOOKERJEE, I.M.S., is appointed to act as Civil Surgeon of Khulna.

CAPTAIN J. G. P. MURRAY, I.M.S., is appointed to act as Civil Surgeon of Mymensingh.

CAPTAIN R. H. MADDOX, I.M.S., on return from leave, reverts to Ranchi as Civil Surgeon.

LIEUTENANT-COLONEL H. C. BANERJEE, I.M.S., is appointed to act as Civil Surgeon of Nadia.

CAPTAIN W. D. HAYWARD, I.M.S., is appointed to act as Civil Surgeon of Purnea.

CAPTAIN W. W. CLEMESHA, I.M.S., is confirmed as Deputy Sanitary Commissioner, Metropolitan and Eastern Bengal Circle.

MAJOR A. W. DAWSON, I.M.S., to hold civil medical charge of Roorkee, in addition to his military duties, *vice* Lieutenant L. B. Scott, I.M.S.

MAJOR G. F. GUBBIN, R.A.M.C., to command the Station Hospital, Shahjehanpore, *vice* Lieutenant-Colonel A. O. Geoghegan, R.A.M.C.

LIEUTENANT-COLONEL J. C. HASLETT, R.A.M.C., to command the Station Hospital, Allahabad, *vice* Lieutenant-Colonel W. D. A. Cowen, R.A.M.C.

CAPTAIN T. A. O. LANGSTON, I.M.S., 7th Lancers, has been granted one year's furlough.

COLONEL W. E. SAUNDERS, C.B., R.A.M.C., is appointed P. M. O., Meerut and Bundelkhand Districts, *vice* Colonel J. F. Supple, C.B., R.A.M.C.

COLONEL G. D. N. LEAKE, R.A.M.C., to be P.M.O., Bombay and Nagpur Districts.

MAJOR A. J. MACNAB, I.M.S., Joint Civil Surgeon of Simla, to the medical charge of the Army Head-Quarters staff and establishments at Simla.

THE services of Captain W. E. MacKechnie, I.M.S., are placed temporarily at the disposal of the Punjab Government for plague duty.

MAJOR S. C. PHILSON, R.A.M.C., to command the Station Hospital, Roorkee, *vice* Major J. S. Green, R.A.M.C.

MAJOR W. C. POOLE, R.A.M.C., to command the Station Hospital, Saugor, *vice* Major J. J. O'Donnell, R.A.M.C.

MAJOR L. WAY, R.A.M.C., to command the Station Hospital, Landour, *vice* Lieutenant-Colonel J. T. Carey, R.A.M.C.

CAPTAIN H. P. JOHNSON, R.A.M.C., to command the Station Hospital, Chaubattia.

CAPTAIN H. A. STALKARTT, R.A.M.C., to command the Station Hospital, Kailana.

CAPTAIN J. D. ALEXANDER, R.A.M.C., to command the Station Hospital, Pachmarhi, *vice* Captain J. D. G. Macpherson, R.A.M.C.

LIEUTENANT L. B. SCOTT, I.M.S., to the officiating medical charge of the 7th Lancers.

MAJOR R. CALDWELL, R.A.M.C., to command the Station Hospital, Delhi, *vice* Captain H. P. Johnson, R.A.M.C.

LIEUTENANT-COLONEL J. G. HARWOOD, R.A.M.C., officiates as P. M. O., Poona District, *vice* Colonel W. E. Saunders, C.B., R.A.M.C., transferred to the Bengal Command.

LIEUTENANT-COLONEL J. J. MORRIS, R.A.M.C., is transferred to the Home establishment on promotion.

LIEUTENANT-COLONEL T. F. MACNEECE and Lieutenant-Colonel W. G. Birrell, both R. A. M. C., have exchanged places on the roster of Indian service.

CAPTAIN J. DAVIDSON, I.M.S., has qualified as an interpreter in Russian.

LIEUTENANT-COLONEL A. H. BURLTON, R.A.M.C., to command the Station Hospital, Jubbulpore.

LIEUTENANT-COLONEL D. F. FRANKLIN, R.A.M.C., to command the Station Hospital, Chakrata, *vice* Lieutenant-Colonel A. H. Burlton, R.A.M.C.

LIEUTENANT-COLONEL H. J. BARRATT, R.A.M.C., to command the Station Hospital, Agra, *vice* Lieutenant-Colonel D. F. Franklin, R.A.M.C.

LIEUTENANT-COLONEL G. G. ADAMS, R.A.M.C., to command the Station Hospital, Nowgong, *vice* Major R. W. Wright, R.A.M.C.

MAJOR S. J. W. HAYMAN, R.A.M.C., to command the Station Hospital, Barrackpore, *vice* Lieutenant-Colonel H. J. Barratt, R.A.M.C.

THE services of Lieutenant-Colonel J. McCloghry, I.M.S., are replaced at the disposal of the Government of Bombay.

THE services of Lieutenant-Colonel C. P. Lukis, I.M.S., are replaced at the disposal of the Government of the United Provinces.

MAJOR P. CARR-WHITE, I.M.S., is posted as Residency Surgeon and *ex-officio* Assistant to the Resident in Nepal.

CAPTAIN P. P. KILKELLY, I.M.S., is posted as Civil Surgeon of Bikaner.

MAJOR J. J. PRATT, I.M.S., is promoted to be Lieutenant-Colonel.

LIEUTENANT-COLONEL R. COBB, I.M.S., Civil Surgeon of Backerganj, is allowed leave for one year and seven and-a-half months.

CAPTAIN F. O. N. MELL, I.M.S., Superintendent, Central Jail, Nagpur, is granted six months' leave.

CAPTAIN W. G. LISTON, M.D., I.M.S., officiates as Civil Surgeon and Jail Superintendent, Sambalpur.

ON relief by Major W. D. Sutherland, I.M.S., Captain J. C. S. Oxley, I.M.S., Officiating Civil Surgeon, Hoshangabad, is appointed a Special Plague Medical Officer, and is posted to Nagpur.

DR. F. PEARSE, Officiating Special Health Officer, Calcutta, is appointed to be a Member of the Board of Health, *vice* Major R. W. H. Jackson, R.A.M.C.

MAJOR I. P. DOYLE, D.S.O., I.M.S., retired from the service on the 31st December, 1903.

THE services of Captain C. S. Lowson, M.B., I.M.S., are placed temporarily at the disposal of the Government of Bombay for employment in the Jail Department.

THE Volunteer Officers' Decoration has been conferred on Surgeon-Major J. W. Field, 1st Bn. G. I. P. Railway Volunteer Rifle Corps, who has also been promoted as Surgeon-Lieutenant-Colonel.

MAJOR G. H. BAKER, I.M.S., Civil Surgeon, Cawnpore, has been granted combined leave for eight months from the 3rd March, 1904.

CAPTAIN J. N. WALKER, I.M.S., to officiate as Civil Surgeon, Ghazipur, *vice* Captain T. W. A. Fullerton, I.M.S.

MAJOR M. T. YARR, R.A.M.C., to be Medical Officer to H. E. the Governor of Bombay.

MAJOR B. B. GRAYFOOT, I.M.S., has been permitted to return to India within the period of his leave.

MAJOR J. G. JORDAN, I.M.S., Civil Surgeon of Chittagong, is allowed combined leave for two years.

CAPTAIN L. ROGERS, I.M.S.,, First Surgeon, Presidency General Hospital, Calcutta, is deputed on special duty to enquire into the nature and prevalence of fevers in certain parts of Bengal.

CAPTAIN C. A. LANE, I.M.S., is appointed to act as First Surgeon, and Captain J. W. F. Rait, I.M.S., as Second Surgeon, Presidency Gentral Hospital, Calcutta, with effect from the 28th Janaury, 1904. Captain R. P. Wilson, I.M.S., acts as Second Surgeon, with effect from the 11th February, 1904, during the absence of Captain J. W. F. Rait, I.M.S., on privilege leave.

CAPTAIN B. R. CHATTERTON, I.M.S., is granted eight months' combined leave.

CAPTAIN H. INNES, I.M.S., is appointed to act as Civil Surgeon of Backerganj, during the absence of Lieutenant Colonel R. Cobb, I.M.S.

CAPTAIN J. MULVANY, I.M.S., Superintendent, Presidency Jail, Calcutta, is allowed combined leave for one year.

LIEUTENANT-COLONEL W. A. SYKES, D.S.O., I.M.S., Officiating Administrative Officer in Baluchistan, is granted leave for two years.

LIEUTENANT-COLONEL J. G. HARWOOD, R.A.M.C., is granted the temporary rank of Colonel while officiating as P. M. O. of the Poona District, *vice* Colonel W. E. Saunders, C.B., R.A.M.C.

PROMOTIONS IN THE I. M. S.

Captains to be Majors. Bengal.—B. G. Seton. *Madras.*—R. H. Elliot, M.B., R. K. Mitter, M.B., W. E. A. Armstrong.

Lieutenants to be Captains C. W. F. Melville, M.B., ; R. McCarrison, M.B. ; J. Masson, M.B., N. S. Wells, M.B., ; W. M. Anderson, M.B. ; E. H. B. Stanley ; W. H. Leonard ; A. W. C. Young, M.B. ; J. G. G. Swan, M.B. ; R. M. Dalziell, M.B. ; J. J. Robb, M.B. ; S. A. Ruzzak ; R. B. B. Foster, M.B.

ON the return of Major Sunder, I.M.S., as Civil Surgeon of Gaya, Captain B. R. Chatterton, I.M.S., is allowed combined leave for eleven months.

CAPTAIN D. R. GREEN, I.M.S., Officiating Civil Surgeon of Midnapur, is allowed combined leave for nine months.

CAPTAIN A. W. R. COCHRANE, I.M.S. Officiating Civil Surgeon of Saran, is allowed combined leave for eleven months.

LIEUTENANT-COLONEL G. A. EMERSON, I.M.S., has been granted one month's extension on medical certificate.

CAPTAIN E. J. MORGAN, I.M.S., Officiating Civil Surgeon, Etawah, is granted nine months' combined leave.

MAJOR C. MACTAGGART, I.M.S., Inspector-General of Prisons, United Provinces, is granted combined leave for eleven months.

LIEUTENANT-COLONEL R. R. WEIR, I.M.S., Superintendent, Central Prison, Farrukhabad, acts as Inspector-General of Prisons, United Provinces.

CAPTAIN T. HUNTER, I.M.S., Officiating Civil Surgeon of Farrukhabad, will have temporary charge in addition of the duties of the Superintendent, Central Prison, Farrukhabad.

Notice.

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Original Articles.

INTESTINAL PARASITES AS FACTORS IN THE MORTALITY OF PRISONERS IN CANNANORE AND RAJAHMUNDRY JAILS.

BY C. F. FEARNSIDE, M.A., M.B., MAJOR, I.M.S.

Memorandum on Ascaris Lumbricoides.

Introductory.—The object of this paper is to draw attention to the prevalence of the entozoon *ascaris lumbricoides* on the West Coast of India as shown by experience in the Cannanore Central Jail. The health of the prisoners there confined has, for any years, been unsatisfactory.

TABLE No. I.

Death-rate of the Cannanore Central Jail from 1881 *to* 1896.

Year.	Daily average population of all classes of prisoners.	Deaths from all causes.	Deaths from bowel affections.	Death-rate per mille.	
				From all causes.	From bowel affections.
1881	696·91	51	42	73·82	60·79
1882	603·36	16	13	26·52	21·55
1883	576·65	24	12	41·62	20·81
1884	489·99	5	3	10·20	6·12
1885	419·61	12	6	28·59	14·30
1886	407·13	18	10	44·21	24·56
1887	363·24	15	5	41·29	13·77
1888	387·67	28	19	72·23	49·01
1889	404·25	11	4	27·21	9·89
1890	522·20	10	5	19·15	9·57
1891	589·59	30	21	50·88	35·62
1892	757·77	64	25	84·46	32·99
1893	795·87	61	39	76·65	49·00
1894	729·63	19	8	26·04	10·96
1895	720·37	16	7	22·21	9·72
1896	640·40	8	1	12·49	1·56

In Table No. I will be found statistics showing the daily average population of the jail, the number of deaths from all causes, the deaths from intestinal affections, such as dysentery, diarrhœa, enteritis, but excluding cholera, and the death-rate for the same for the period of sixteen years between 1881 and 1896. The total death-rate has been uniformly high, and that from bowel affections has generally been considerable. Only during the last three years included in the series has there been a steady reduction in the mortality generally and especially in that due to bowel complaints. This reduction is believed to be due to the recognition of the fact that *ascaris lumbricoides* is excessively prevalent in this part of India, and that to its presence may be traced many of the diseases which have caused mortality in previous years.

My attention was first drawn to the importance of this parasite by a *post-mortem* examination made a few days after I took charge in 1894. The case was one of diarrhœa, with anæmia and dropsy. In the *post-mortem* a mass containing 37 worms was found at the ileocæcal valve, and it at once occurred to me that this was the cause of the intractable character of the case. Acting on this idea, regular resort was had to anthelmintics, in the treatment both of prisoners in jail and of prison subordinates. The results, both in respect of total mortality and sickness and in respect of intestinal disorders, will be clearly apparent from Table No. II, which shows the monthly admissions and deaths among all classes of prisoners during 1896 and the four previous years. The reduction in the number of dysentery cases from 144 in 1892 to 10 in 1896, in that of muco-enteritis from 77 in 1892 to 9

TABLE No. II.

Comparative Statement of Intestinal Complaints, &c., for the years 1892 to 1896.

Months.	Dysentery.					Inflammation, intestinal, catarrhal or muco-enteritis.					Diarrhœa.					Daily average sick					Total number of admissions.					Total number of deaths.				
	1892.	1893.	1894.	1895.	1896.	1892.	1893.	1894.	1895.	1896.	1892.	1893.	1894.	1895.	1896.	1892.	1893.	1894.	1895.	1896.	1892.	1893.	1894.	1895.	1896.	1892.	1893.	1894.	1895.	1896.
January	4	15	3	1	4	..	6	9	..	3	8	3	3	..	..	19·84	36·26	27·13	24·68	10·52	40	69	58	29	22	..	6	2	..	1
February	..	10	3	1	..	..	6	6	..	..	8	2	..	..	..	28 17	35·93	34·07	19·96	18·69	56	48	55	36	44	2	6	3	2	1
March ..	3	6	2	1	..	3	11	2	..	1	3	1	..	..	..	28·10	24·03	35·10	18·84	11·58	51	35	55	38	27	1	11	..	..	2
April ..	9	4	3	2	..	15	6	2	..	..	..	..	..	..	..	26·00	23·60	42·00	16·17	12·00	54	27	61	21	31	3	4		2	1
May ..	16	1	3	9	1	24	5	4	..	..	..	14	1	..	1	33·52	28·03	37·97	14·19	14·19	109	40	47	37	25	..	1	1	2	..
June ..	11	8	13	5	..	10	..	13	3	2	..	32	..	..	..	41·33	30·58	41·57	19·58	19·73	78	73	79	41	36	4	3	3	1	1
July ...	21	8	8	14	1	9	7	14	4	1	..	11	..	..	..	31·48	41·71	53·39	29·00	21·03	99	82	116	58	36	24	7	3	4	..
August	22	7	2	6	1	2	3	4	7	1	10	27	3	..	..	14·97	50·48	52·29	26·29	26·00	72	108	87	34	37	9	13	2	1	..
Sept...	10	3	1	2	1	..	1	1	2	1	18	6	10	..	..	36·23	33·03	54·43	21·37	23·47	93	55	102	28	32	12	6	2	..	..
October	18	4	4	4	..	..	1	..	1	..	14	6	2	..	..	35·23	21·94	40·35	18·87	25·97	88	35	50	29	39	5	4	1	2	1
November	16	4	1	5	1	..	..	3	3	..	3	2	..	..	..	35·18	21·13	25·33	18·93	26·3	80	34	35	24	27	3	..	1	1	..
December	14	11	2	1	1	14	1	..	..	..	10	..	..	..	..	35·00	23·16	26·23	12·52	27·3	72	41	38	18	29	1	..	1	1	..
Total ..	144	68	45	51	10	77	47	58	20	9	79	104	19	..	1	397	363·69	469·86	241·06	236·24	892	647	788	388	385	64	61	19	16	7

in 1896 and in that of diarrhœa from 79 to 1, the last being a case of choleraic diarrhœa is very noteworthy.

Records of the number of worms passed have only been maintained since July 1895, and even since that date the numbers recorded are only approximate. Table No. III shows the number of parasites accounted for in the calendar year 1896, and it will be seen that 255 patients passed 2,703 worms. The fact that the free population is more infested by this parasite than convicts in prison is well brought out, and the comparative superiority of the prisoner in this respect is doubtless due to the greater cleanliness exercised in the preparation of food.

Table No. III.

Showing Statistics of Worms passed during the year 1896.

Months.	Total number of convicts.		Total number of worms passed.		Total number of convicts both in and out-patients.	Total number of worms passed by both in and out-patients.	Warders and their families.	Total number of worms passed.
	In-patients.	Out-patients.	In-patients.	Out-patients.				
January ..	1	1	3	6	2	9	..	..
February ..	8	6	28	57	14	80	..	..
March ..	8	13	39	98	21	182	10	737
April ..	4	5	7	36	9	43	1	20
May ..	5	10	18	21	15	89	1	5
June ..	10	18	49	116	28	165	8	156
July ..	8	15	58	55	23	113	2	16
August ..	6	6	41	31	12	72	4	168
September	4	16	28	65	20	88	..	..
October ..	4	19	20	110	23	130	5	236
November	7	24	110	249	31	359	2	6
December	8	14	21	62	22	83	2	51
Total to 20th December	73	147	412	901	220	1,313	35	1,390

There is no reason to suppose that the prevalence of *ascaris lumbricoides* during the last three years was exceptional. On the contrary, there is reason to believe that the same parasite has existed to an equal extent in previous years, but that its presence or its importance has been overlooked. An examination of the hospital case book of the Cannanore Central Jail in previous years suggests grave doubt whether in many cases the diagnosis or treatment were very skilful or correct. When it is found that a case, treated as remittent fever, showed on *post-mortem* the appearances of tubercle of the lung: when another entered as debility gave *post-mortem* proof of abscess of the kidney; while a third diagnosed as simple continued fever was actually due to dysentery, it is impossible to place implicit reliance on the returns. That *ascaris lumbricoides* was present in many cases is, however, established beyond doubt by the records of *post-mortem* examinations, and it seems a not unreasonable assumption that if the line of treatment which has proved so successful in dealing with bowel complaints in 1894-96 has been followed in earlier years, similar results would have accrued.

In eleven years from 1883 to 1893 there were four admissions for *tænia solium*, five for *oxyuris vermicularis*, and 12, or about one per annum, for *ascaris lumbricoides*, in addition to some 23 cases in which patients admitted for other diseases were found to have the worm. Comparison with the figures of 1896 shows in how small a percentage of cases the parasite was formerly detected.

In 1892 there was a special outbreak of sickness in the jail due doubtless to some cause affecting the general health. The sickness became so serious that a medical officer was deputed to make an enquiry. The gist of his recommendations was that the raggi flour was ground too fine, the 'tailings' which contained, according to him, salts necessary to digestion, being thrown away, and that the vegetables were not sufficiently antiscorbutic. When it is remembered that the tailings of raggi are mainly the outer coat of the grain, which, if traced in the fæces, will be found almost entirely unchanged by the processes of digestion, it may be doubted whether their retention would be of much service. On the other hand, experience shows that the finer the flour and especially the outer coat, is ground, the less irritant it is. Finely ground flour is given to sick patients because it makes a more homogeneous pudding, as the agglutinated particles of starch are better separated, more softened in the cooking, and hence more easily assimilated in the process of digestion. As to the vegetable supply, the convicts receive the same vegetables now as then. Therefore the causes suggested in 1892 as remedial for the outbreak of sickness might probably have been put on one side as unimportant, if the importance of intestinal parasites in this locality had been recognized. There was no allusion to entozoa in the report.

The prevalence of *ascaris lumbricoides* on the West Coast is doubtless attributable to the damp climate of Malabar, which is peculiarly suitable for the development of the ova not only of this parasite, but of many others. Another nematode which is very common on the coast is *filaria sanguinis hominis*. Three others equally common are *oxyuris vermicularis*, *trichocephalus dispar* and the *anchylostoma duodenale*, which are generally associated together in the same individual. Nor is man the only host in this district which is infested with such parasites. In the crow and other birds, tapeworm, the acanthocephalic nematode the *echinorrhynchus*, and *ascarides* are very common. I have detached as many as 83 heads of tapeworm from the bowel of a single crow. The Indian method of defæcating in the open and leaving the fæcal deposit exposed causes the worms, if passed, to be eaten by crows, fowls, &c., and the ova, uninjured by the process, are thus freely disseminated. The droppings of these birds frequently abound with these ova. The fæces

exposed to the heat of the sun, rapidly dry and, as the fæcal matter breaks up, the ova are blown about by the air and are so carried into the wells. Mosquito larvæ, white ants, and other insects swallow them. The eggs are also particularly sticky and easily adhere to the jaws or antennæ of insects, and are thus carried into the food or into the water consumed by man. The native habit of feeding on the ground increases the chance of infection from insects settling on or passing over food. Self-infection also occurs and here again is assisted by native customs, the practice of washing the person by the hand after defœcation being very liable to produce this result, just as in the case of children self-infection with the ova of *oxyurus* is known to occur. Other parasites occur in other animals, the frog being infested by a parasite (also a nematode) which has much the same appearance as the *rhabdonema intestinale* found in man in cases of Cochin China diarrhœa. As frogs commonly occur in the wells of the country, and as its parasite is prolific, having often 50 and more young worms inside it, it is certain that these worms must frequently find their way into the human intestine. It is possible that the sudden outbursts of diarrhœa which from time to time occur may have some connection with this fact. The prevalence of *ascaris lumbricoides* is, however, neither exceptional nor difficult to understand.

I now proceed to deal with the symptoms indicative of the presence of ascaris lumbricoides in those harbouring this parasite in Southern India. Those affected, are usually very tolerant of and neglect the earlier symptoms. In the first stage, the chief symptom is headache and a tendency to faint, and the usual concomitant symptoms of malaise. The sufferer is dyspeptic and disinclined for food; fulness is felt at the pit of the stomach, and some sort of undulatory movement in the abdomen. This is usually felt in the epigastric region and is relieved by pressure. This peculiar motion is due to the meandering of the worm in the stomach and duodenum. If the worm or worms are evacuated there is a rapid recovery. There may be a slight rise of temperature.

Second Stage: Muco-Enteritis.—The above symptoms continue in an increased form, and are often accompanied by vomiting which is often severe and difficult to control. This stage may show two chief symptoms quite distinct. If the parasite is high up in the intestinal tract—say in the stomach, duodenum, or the jejunum, the vomiting is particularly marked, while if the parasite is located in the ileum and near the ileo-cæcal valve, then there is severe diarrhœa and a collapsed condition from the drain on the system. Of course diarrhœa may be present in either case, but different in degree; and so long as the worm remains in the gut, so long do these symptoms remain, the patient getting worse and worse. Added to this is fever. The temperature runs up to 102° in the evenings for several days with a fall of a degree in the mornings. The abdomen is distended with flatulence, and pains in the joints are particularly complained of. Retention of urine is common, and the urine has often to be drawn off and frequently contains albumen. The stools contain much dirty agar-jelly-looking mucus and are very watery. Long after the evacuation of the larger worms, the fever and the catarrh of the intestine remain, as the bowel takes some time to regain its normal condition. This febrile condition may last for weeks and simulate exactly enteric fever; and not only this, the *post-mortem* appearances are often similar. Pain in the right iliac region is well marked and one not cognizant of the prevalence of the *ascaris lumbricoides* might mistake the whole disease for enteric. Hence these cases have in the past been returned as remittent, intermittent, and simple fever.

Third Stage: Dysentery.—The bowel of the native of this district is seldom rid of these entozoa and infection is constant and oft-repeated. If the *ascaris lumbricoides* have made their habitat at the ileo-cæcal valve and set up irritation near it, septic inflammation of the larger intestine easily occurs. The *ascarides* also lodge in the large intestine at the upper part. Their presence and that of purulent matter from the upper small intestinal inflammation set up irritation along the large bowel. Fever still continues and is of a much more hectic type; the stools at first may not vary from that of the second stage but sooner or later they become dysenteric. I need not go on to describe the symptoms of dysentery which are so well known. The patient may recover or die from perforation of gut, peritonitis or pyæmia and other sequelæ.

Boils.—Amongst those affected with this nematode, boils are very common. Evacuation of the worms is followed by a rapid cessation of the boils. The boils are either due to the direct action of the toxin on the skin capillaries causing a local depressed vitality at some point which then becomes a suitable place for the microbes of suppuration to grow, or the catarrhal state of the bowel may so depress the patient generally that a crop of boils is the result.

Sequelæ.—The sequelæ of *ascaris* are numerous and include the following:—Boils, chronic diarrhœa, chronic dysentery, meningitis, peritonitis, perforation of bowel by worm, abscess of liver, nephritis, anæmia, herpetic eruptions on the abdomen, dropsy, emphysema of the gut.

Treatment.—A 5-grain dose of santonine should be given, and 24 hours afterwards a purge. This is better than giving the two together, because it is much more effectual, since the parasite is exposed to the action of the drug for 24 hours, and is in consequence anæsthetized

and easily brought away by the purge. If no improvement results, a second dose ought to be prescribed in the same way. It is frequently stated that one dose of santonine and castor oil is sufficient to rid the bowel of round worms—this is quite opposed to my experience.

Pathology: Nausea—This is said to be caused by reflex action from the presence of the parasite in the duodenum and stomach. I consider there is another cause of the nausea. The presence of the parasite in the stomach is attended with frequent eructations. The worm has a most disagreeable smell which makes the gas eructated from the stomach have a still more disagreeable odour, and this is an additional reason for the nausea and vomiting. There is also a toxic cause alluded to below.

Arthur and Chauson have proved that living ascarides contain a poison which, when injected into rabbits, causes death. Other authors have shown that the poison produced acts on the nervous system as well as on the blood. It cannot be definitely explained why toxic symptoms are not always present in these cases, but their appearance may depend on the duration of the disease, and on the number and vitality of the worms.

Febrile disturbance.—Fever may be set up in two ways: *First*, the absorption of this toxin into the circulation may itself disturb the heat centre and fever may result; *secondly*, the movement of the parasite in the intestine may set up a catarrh, which is followed by fever. The former assumption will explain some of the cases of sudden death after one or two days as exemplified by convict 2503 shown in the subjoined table, * and the latter assumption will explain cases which are more prolonged as exemplified by convict 5128. Again, such a rapidly fatal course might be explained by microbic toxin, but the probabilities appear to be in favour of the other hypothesis. The occurrence of articular pains may likewise be explained as due to toxic effects.

*2503	21 Feb. 1884.	Acute enteritis.	12	Sudden attack of diarrhœa on 20th February 1884; died the following day; congestion only of the mucous membrane of the gut.
5128	3 Aug. 1891.	Simple continued fever.	8	Case book shows that this case was treated by arsenic, diaphoretics, bromides, Warburg's tincture The *post-mortem* disclosed intestine with thickened coats and superficial ulceration of the ileum and 8 *ascaris lumbricoides* found in small bowel. Death was returned due to exhaustion produced by simple continued fever.
1005	16 Sept. 1885.	Chronic mania.	100	Case book records peculiar behaviour, noisy, jerking of right shoulder, loss of memory. No suicidal tendency. *Post-mortem* showed he died of asphyxia from choking, the foreign body being a lump of raggi pudding.

Action on the nervous system.—Headache is explained similarly. I have had several cases of hystero-epilepsy and hysteria amongst the female convicts, which have been cured by the evacuation of the parasite. Had such cases been treated by bromides, the treatment would have been useless. The cause would still remain, and with prolonged retention of the parasite, a depressed condition of mind would have arisen, which would have been difficult to combat. Lunatics are particularly affected by these entozoa owing to their dirty habits, but it may be that the parasites are also the cause of lunacy. There is no reason why melancholia, &c., may not be set up by this toxin. It causes a depressed condition of mind, which, if continued, may result in melancholia. The case of convict No. 1005 may be cited. From the case book it would appear that this was the true cause of his state of mind rather than a mere accidental presence as in other lunatics. I have had several convicts who were distinctly silly, and recover after evacuation of the parasites. One convict, No. 7165, was described by the hospital assistants as "off his head" may be mentioned. He passed 87 worms in nine days, after which his mental aberration was cured. Whether these nervous systems are purely reflex or due to poison is still a matter for discussion. The parasite is the exciting cause of fits of epilepsy in an epileptic. It excites fits of asthma in the asthmatic, the cause being both reflex action and the toxin. Several of the *post-mortems* show serous effusion in the meninges and congestion of the brain superficially.

Muco-Enteritis is explained by the movements of the parasite and also by its toxin and effete products. It keeps constantly boring into the mucous membrane and sets up local inflammation. One must not forget that this applies to the smaller and younger members of this nematode. Small congested areas are set up, which may or may not go on to ulceration according as the parasites remain in the bowel. If the wall of the bowel gets thinned out by ulceration, the worm may bore its way into the peritoneum setting up peritonitis.

There can be little doubt that it causes ulceration of the bowel and even emphysema of the bowel. The case of convict No, 8655 Venkiah may be quoted from my notes.

There were twenty-one round worms in the two clusters and the longest was 14½ inches

The bowel at this place had two deeply congested areas which were of a purple colour. At the spot where the upper group of worms lay was a raised emphysematous patch measuring five or six square centimetres and two centimetres high. The emphysema was caused by infiltration of gases from the lumen of the bowel and the constant irritation produced by the movements of the parasites over the inflamed bowel. Ulceration existed in one or two places round the emphysematous patch.

As a cause of obstructive jaundice I need not mention the well-known fact of its entering the bile ducts; but to exemplify its migratory habits, I would draw attention to the case of convict 9693 whose sentence of imprisonment was only two months. One worm, 12 inches long, was found in the common bile duct, and another of the same size was embedded in the substance of the left lobe of the liver.

Ova of ascarides lumbricoides.—It is usually said that water and wet earth are required for the development of the ova, but as my experiments show, the ova did not develop when placed deeply in mud. I find by experience that they incubate best on the side of a dry beaker or other dry object or bottle, &c. Besmear the side of a beaker with the ova, and the moisture of the atmosphere of Malabar is sufficient to do the rest. From a few days to a few weeks the embryo develops according to the direct exposure and activity of the germ plasm. The colour, by osmosis as it were, vanishes and the capsule gets thinner till the slightest pressure of the glass slip bursts the capsule and the hungry embryo escapes. The embryo has no differentiated internal anatomy which would enable it to live a free existence. As writers on the subject presume an intermediate host, I spent much time in feeding fowls, white and black ants, larvæ of mosquitoes on these ova, but with negative results. The ova pass through the ducts of these insects with a slightly thinner capsule, but the embryo never made its exit, nor were the embryos apparently better nourished. Experimenters have tried the experiment of swallowing the embryo in its thin capsule, and also giving these to children with negative results. This is a point of importance, for the individual was in a healthy state and the gastric and liver, &c., functions were above par. I should not like to try the same experiment with those in ill-health when the functions are below par. It is probable that if the ova with the embryo developed are carried by water, ants or the wind and swallowed in food by people in ill-health the embryo develops and hatches.

Protection against infection.—The female *ascaris lumbricoides* grows to a large size on the West Coast. I have seen some passed, 14 inches long. Any one of these contains millions of ova. Of course these ova do not all come to maturity, but it is alarming even to think of the numbers that do. Disinfectants are of no value in acting on the ova, as these mixed with the fæcal matter lose their action after time. The only means I see of combating the danger is by some process of drying the fæcal matter and afterwards burning it. The fæcal matter might be mixed with saw-dust and chaff, and, when dry, burnt. The use of shallow trenches for night-soil is evidently not advisable in localities like the West Coast, where these parasites are prevalent, as the ova are so much nearer the surface and so much the more able to be carried by insects and wind. If burning is impossible, trenches about 1½ feet should be used, where with more earth above, the ova might have a greater chance of undergoing fatty degeneration and decay. Adult *ascarides* should be collected and *burnt*. During 1896 every convict admitted to the Cannanore Central Jail was treated by santonine on admission, and the year's results in Table II speak for themselves. Every prisoner admitted to hospital was also so treated and with such excellent results, as it eliminates this cause of disease at once and aids diagnosis. The sickness and mortality produced by this parasite ought to be impressed on the people at large. Steps should be taken to sell santonine in small packets throughout this and other districts, and the results as regards health will doubly repay the outlay. Pice packets of santonine might be sold at post-offices like the quinine packets in malarial districts. Dysentery, diarrhœa and intestinal affections are often laid to the door of malaria when an intestinal parasite is the cause. In the free distribution of this drug difficulty presents itself. The santonine may be given, but a purge is also necessary. The packet might be made up along with a second, *viz.*, calomel, grs. v., which could be administered after the santonine or, as some physicians say, together. The sepoy like all others is liable to infection, and sanitary and other measures are equally applicable to his case as to that of the convict. Cleanliness of food and person, I need not say, are imperative.

Conclusions.—The following are the main conclusions arrived at in this paper:—

1. Original infection takes place in children, and adults in ill-health.

2. The disease is continued by a process of auto-infection, the ova, with the live embryo having been found by me under the dirty nails of persons harbouring the parasite.

3. Sanitary measures to be recommended are collection and burning of the parasite and of the fæcal matter, when possible, and 1½ feet nightsoil trenching.

4. As a prophylactic measure the distribution of packets of santonine and calomel in 5 grains doses.

TWO CASES OF ENTERITIS CAUSED BY ASCARIS LUMBRICOIDES.

CASE VII—1896.

DISEASE—ASCARIS LUMBRICOIDES,

Convict No. 2102. Iyappen. Age—22 years. Health —good. Weight—120 lb. Sentence—20 years.

Hospital—24th June 1896.

Month and date.	Particulars of case and treatment.	Diet.
1896.	*Previous history.*—No previous history of disease except occasional attacks of colic and griping pain in the belly and has passed round worms in his native place.	
	Condition on admission.—He had a temperature of 101°, and bowels irregular, headache and weakness with high-coloured urine, which is scanty. Complained chiefly of pain round the umbilicus and sickness. He was detained on the 23rd June 1896 and given a dose of santonine, and jalap on the following morning when he was admitted to hospital.	
June 24th ...	The temperature will be seen from the chart. His bowels moved six times when he passed three *ascaris lumbricoides*. He vomited three times and complains of pain in the abdomen. He is weak and exhausted.	Milk, arrack.
,, 26th ...	Fever continues; absence of vomiting, but the griping still continues; urine free and light coloured.	
,, 27th ...	Same condition and santonine is again prescribed. Bowels moved once.	
,, 29th ...	No more worms passed after the ol. ricini had been given in the morning. Fever is still present, which is due to the presence of more parasites or to intestinal catarrh and toxin poisoning. Bowels moved thrice. Santonine is again prescribed.	
,, 30th ...	Fever continues; bowels moved thrice; he passed one round worm; less pain and headache.	
July 1st ...	Same state and weak. The rise of the temperature to 102° was due to the irritation of the ascaris present in the bowel.	
,, 3rd ...	Still weak and complaining of slight pain in the abdomen.	
	Treatment.—Bismuth, salol, quinine.	Milk diet, arrack.
,, 8th ...	Motions non-bile-stained, these being previously watery.	
,, 13th ...	Convalescing.	
,, 16th ...	Convalescent and cured.	

CASE VIII—1896.

DISEASE—ASCARIS LUMBRICOIDES.

Convict No. 2420. Anandan. Age—18 years. Health —good. Weight—94 lb. Sentence - 6 months. Hospital—9th June 1896.

Month and date.	Particulars of date and treatment.	Diet.
1896.	*Previous history.*—Had a previous attack of fever similar to the present, about a year ago, which lasted several months. No other illness to speak of. *Present condition.*—On admission he had a temperature of 101°; bowels irregular; urine scanty and high coloured. He complained of prostration, headache and pain in the limbs and colic. He was prescribed santonine on the 9th June 1896, and ol. ricini on the following morning when he had several motions, in which were five round worms.	
June 12th	Temperature will be seen in the chart. His bowels moved twice and were watery; urine still high coloured and he still complains of colic.	Spoon.
,, 15th ...	Fever continues; frequent motions and still has pain in the abdomen. He is weak and exhausted.	
,, 16th ...	Slight bronchial catarrh and pain in the abdomen. Santonine is again prescribed and also pul. jalap co. next morning.	
,, 17th ...	No worms are noted, but probably those not visible to naked eye have been got rid of. There is also catarrb of the intestinal tract.	
,, 21st ...	Same condition.	
,, 26th ...	Fever continues.	
,, 28th ...	Fever continues; urine is normal.	
July 1st ...	His condition the same, still fever, watery stools containing dirty agar-jelly-looking mucus. *Treatment.*—Salol, Bismuth, Dover's powder and quinine.	Spoon diet, milk, arrack.
,, 3rd ...	Motions are bile-stained, is weak and exhausted.	
,, 8th ...	Improving.	
,, 13th ...	Improving. *Treatment.*—Tonics.	
,, 16th ...	Convalescent and cured.	

II.—MALARIA, ANKYLOSTOMA DUODENALE, ASCARIS LUMBRICOIDES.

RAJAHMUNDRY CENTRAL JAIL.

THE object of this part of the paper is to examine and, if possible, elucidate the causes which have led up to the periodical outbreaks of sickness that have from time to time occurred among the prisoners confined in the Rajahmundry Central Jail. The health of this jail has been for several years unsatisfactory.

It is a significant fact that the occurrence of *ankylostoma duodenale* in the Rajahmundry Central Jail was discovered in the year 1887 by Assistant-Surgeon Hadden. This was the year

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TWO CASES OF ENTERITIS CAUSED BY ASCARIS LUMBRICOIDES.

CLINICAL CHART OF TEMPERATURE, &c.

No. 2102 *Name—Ayyappan.* *Age—22 Years.* *Disease—Ascaris Lumbricoides.* *Result—Cured.*

Date	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Temperature, Fahrenheit's Scale / Temperature, Centigrade Scale	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	
Pulse. M.	80	76	80	80	80	80	72	76	72	78	76	72	74	72	72	72	72	72				M. Pulse.
Pulse. E.	76	80	110	112	76	72	96	112	108	80	78	72	72	72	72	72	72	72				E.
Resp. M.	20	18	20	20	20	20	18	20	18	20	18	18	18	18	18	18	18	18				M. Resp.
Resp. E.	18	20	20	26	18	18	18	18	22	20	20	18	18	18	18	18	18	18				E.
Motions.	1	1	1	1	1	3	2	2	2	2	2	2	2	2	2	2	2	2				Motions.
Urine, ozs.	Urine normal.																					Urine, ozs.
„ Sp. Gr.																						„ Sp. Gr.
„ Reaction.																						„ Reaction.
„ Chlorides																						„ Chlorides.
„ Albumen.																						„ Albumen.
Day of Dis.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		Day of Dis.

TWO CASES OF ENTERITIS CAUSED BY ASCARIS LUMBRICOIDES.

CLINICAL CHART OF TEMPERATURE, &c.

No. 2420 *Name—Anandan.* *Age—*18 *Years.* *Disease—Ascaris Lumbricoides.* *Result—Cured*

Date	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
Temperature, Fahrenheit's Scale. M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	M. E.	Temperature, Centigrade Scale.
103°																						39°
102°																						
101°																						38°
100°																						
99°																						37°
98°																						
97°																						
96°																						36°
Pulse. M.	74	75	74	72	74	74	72	78	74	74	76	96	96	80	74	72	72	72	72	72	72	M. Pulse.
E.	98	102	98	80	85	80	86	80	94	94	84	80	98	96	98	96	94	76	80	76	74	E.
Resp. M.	18	18	18	18	17	18	17	18	18	17	18	18	24	20	20	20	18	18	18	18	18	M. Resp.
E.	20	20	20	20	20	19	20	20	20	24	20	20	20	24	24	24	22	19	19	20	18	E.
Motions	3	2	2	1	3	....	3	2	1	3	2	1	....	2	1	1	1	1	1	1	1	Motions.
Urine, ozs.	Urine healthy throughout.																					Urine, ozs.
,, Sp. Gr.																						,, Sp. Gr.
,, Reaction.																						,, Reaction.
,, Chlorides.																						,, Chlorides.
,, Albumen.																						,, Albumen.
Day of Dis.	2	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Day of Dis.

in which the District Jail was closed and its prisoners sent to the Central Jail. It was also the year in which beri-beri was supposed to have been introduced into the jail by the Burmese arrivals. In 1887 beri-beri was supposed to be due to, or to have a connection with, ankylostoma and it will be noticed, as at least a curious coincidence, that the discovery of ankylostoma synchronized with the supposed introduction of beri-beri. It is at least certain from an examination of the Hospital Case Books that the cases returned as beri-beri were treated with the treatment usual in ankylostoma, *viz.*, the administration of thymol. After the year 1887, there is no mention in the records of the parasite having been again noticed, till I found it in my first *post-mortem* (March 1897). Since then it has occurred in 75 per cent. of the necropsies. The malarial parasite by wholesale destruction of the red blood cells causes an anæmia, which tends to dropsy and at the same time alters the structure of certain viscera, *e.g.*, the liver, spleen, and kidney. This alteration in the structure leads also to dropsy, a result superadded to that produced by the anæmia. The ankylostoma, a blood-sucking nematode, by itself produces a pernicious anæmia, as well as dropsy and fatty degeneration of the internal organs. In 90 out of 120 cadavera, I have detected this parasite in the bowel, and since it is established that these parasites—that of malaria and the ankylostoma—can even separately cause dropsical symptoms and high mortality, it is but reasonable to conclude that their effects will be far more marked if combined in the same individual. The statement that beri-beri is a disease endemic in the Northern Circars was made so long ago as 1835 by Assistant-Surgeon Malcolmson, I.M.S. His book, though no doubt it answered a useful purpose at the time in bringing the disease to public notice, can no longer, in view of the great progress of medical knowledge and research since 1835, be considered to be possessed of authority. Since then, so far as I am aware, no further enquiry into the question whether beri-beri is really endemic in the Northern Circars, has been made. In the Manual of the Godaveri District, written by Mr. Henry Morris, C.S., in 1878, a statement occurs to the effect that "one of the principal diseases of the district is beri-beri. The Telugu name for this disease is 'Ubbu-Vayuvu' or rheumatism with dropsical swelling. The acute form is attended by intermittent fever, the chronic form is more frequently the sequel of rheumatism and fever." It will be here observed that this description, obviously written by a layman, was penned before Laveran, in 1880, discovered the malarial parasite. The description which Mr. Morris gives of beri-beri corresponds well with what is now known as malarial cachexia, but it does not agree with beri-beri, which is neither a rheumatism nor an intermittent fever with dropsy. It will, I think, be generally admitted that much clearer evidence than that of Malcolmson and Morris is required before the endemic occurrence of beri-beri in the Northern Circars can be held to be proved.

Turning now to the history of the Rajahmundry Jail itself, there were, prior to 1887, two separate jails in Rajahmundry, one the present Central Jail, the other the District Jail. These were situated about 1½ miles apart, the District Jail being located close to the river Godaveri, while the Central Jail stands on a higher level. In 1887 the District Jail was closed and all its prisoners, who were necessarily short-term convicts, were removed to the Central Jail. Now the mortality among short-term prisoners is always appreciably higher than among long-term convicts, and the amalgamation of the District with the Central Jail was, therefore, an event likely to affect the health of the latter unfavourably. If it were found that the mortality of the decade (1887-96) since the amalgamation compared unfavourably with that of the decade (1877-86) before the amalgamation, such a change may be explained by the inclusion during the later decade (1887-96) of short-term prisoners.

TABLE I.

Comparative Statement of Admissions from Malarial Fevers.

Years.	Admissions from intermittent fever in	
	Rajahmundry Central Jail.	All Central Jails and the Penitentiary.
1880 ...	2,155	2,601
1881 ...	1,315	1,662
1882 ...	1,339	1,564
1883 ...	845	1,148
1884 ...	477	744
1885 ...	384	654
1886 ...	564	831
1887 ...	772	977
1888 ...	809	1,036
1889 ...	377	570
1890 ...	188	565
1891 ...	195	577
1892 ...	123	787
1893 ...	76	635
1894 ...	164	835
1895 ...	235	882
1896 ...	230	708
1897 ...	436	912

As will be seen from the table above, the Central Jail long before 1887 showed an extraordinarily high admission rate for fever, and the confinement in it of short-term prisoners, who notoriously show a higher death-rate than long-term prisoners, would necessarily affect prejudicially the statistics of mortality. In the same year, 1887, occurred the arrival of Burmese prisoners from Rangoon, an arrival to which has been ascribed the importation of beri-beri and the infection of the jail buildings with that disease. But if beri-beri is endemic in the Northern Circars, it is not clear why it should require im-

portation from a foreign source to set up the infection, while if the complaint is not endemic in those districts, the theory of importation and infection must be at once heavily discounted. On either hypothesis it seems much more probable that the real "sanitary event of the year" was not the arrival of the Burmese prisoners, but the amalgamation of the two jails. In the following table the admissions to hospital throughout the two decades are set forth in comparison with the statistics of rainfall.

TABLE II.

Comparative Statement of Admissions to Hospital.

Years.	Admissions per mille from intermittent fever. Rajahmundry. District Jail.	Admissions per mille from intermittent fever. Rajahmundry. Central Jail.	Total admissions per mille from all causes.	Rajahmundry Central Jail daily average strength.	Total rainfall.	Deaths per mille excluding those from epidemics.
1877 ...	41·9	404·1	1066·9	1036·62	...	23·2
1878 ...	87·5	290·9	862·8	1192·60	...	21·8
1879 ...	142·2	669·9	1573·5	967·73	43·6	58·9
1880 ...	153·2	2263·5	2997·0	956·47	28·4	85·5
1881 ...	129·8	1372·8	1839·0	957·88	38·30	25·1
1882 ...	226·7	1494·7	1893·6	895·78	45·0	19·98
1883 ...	215·36	1132·23	1716·5	746·31	36·29	19·94
1884 ...	92·76	754·35	1327·7	632·78	43·25	17·06
1885 ...	59·24	668·53	1192·7	575·39	41·17	19·10
1886 ...	47·42	1020·03	1303·1	555·59	69·61	12·60
1887 ...	...	1409·7	1857·9	548·92	35·40	74·97
1888 ...	...	1532·9	2111·6	527·10	39·46	20·87
1889 ...	...	723·9	1478·6	520·75	62·65	19·20
1890 ...	...	354·5	1272·8	530·33	53·43	26·23
1891 ...	...	360·6	1155·4	543·52	29·50	64·39
1892 ...	...	218·4	1054·7	845·66	64·50	68·15
1893 ...	...	129·2	401·9	627·01	59·15	19·14
1894 ...	...	208·9	625·5	794·63	38·85	18·88
1895 ...	...	322·7	843·4	762·40	51·33	24·92
1896 ...	...	175·4	811·2	849·39	20·28	47·09
1897 ...	...	*463·76	2045·12	1015·59	50·97	...

* Does not include other malarial affections.

Two facts will at once attract attention in the above table, *viz.*:—first, the consistently high admission-rate for intermittent fever in the Central Jail throughout the whole period of 21 years; second, the occurrence in 1880, the year following the great famine of 1877-79, of an outbreak of sickness surpassing even that of 1897. Referring to the second point first, it is not likely to be merely a coincidence that the great increase in the number of admissions to hospital occurred in connection with two famine periods. If the extraordinary sickness of 1897 is attributable to the presence in the jail of the infection of beri-beri introduced by Burmese convicts in 1887, how is the still more extraordinary outbreak of sickness in 1880, eight years before the introduction of beri-beri, to be accounted for? If, on the other hand, the sickness of 1880 was due to causes other than beri-beri, the hypothesis that it was this disease which was at work in 1897 can at least derive no support from any historical reasoning. But when we turn to the other main point brough out by the figures of Table II, we at once find a feature which is present throughout the period of 21 years, and which alone is sufficient to account for both outbreaks, *viz.*, the continued presence of malarial fever. It will be seen that in 1880, this cause accounted for 2,263·5 admissions per mille out of a total admission-rate of 2,997 per mille, while in no less than seven years within the period taken the admission-rate from this cause exceeded 1000 per mille That such prevalence of malarial fever is abnormal and excessive will be further proved by Table No. I, whence it will be seen that out of 17,688 admissions for malarial fever in all the Central Jails of the Presidency (including the Penitentiary) between 1880 and 1897, no less than 10,684 or over *sixty per cent.* are accounted for by the Rajahmundry Central Jail. Malaria is the predisposing cause to pneumonia, dysentery, phthisis, &c. This is well illustrated by the fact that in 293 necropsies (1887-96), tubercle of the lung was found in 61 cases and ulceration of the bowel in 116. It is probable that these would have been even more numerous, were it not that the records give no information regarding the condition of these viscera in many of the *post-mortems*.

It is thus found that the history of the Rajahmundry Jail shows a persistently high admission-rate due to malarial fevers, coupled with periodical enhancements of the same disease following periods of famine and scarcity. As the sickness of 1897-98 likewise coincided with and followed a period of famine, the inference that it was due to the same causes as had produced similar results under similar conditions before is a very strong one. It may thus be unhesitatingly claimed that the investigation of the history of the Rajahmundry Jail is favourable rather to the view that its unhealthiness has been due to malaria than to any other cause. The microscopic evidence in favour of malaria is as follows. The blood of 800 convicts, between the years 1898 and April 1901, who were admitted to hospital for fever, harboured the malarial parasite in over 50 per cent. The relative proportions were 65 per cent of the benign tertian, 30 per cent of the malignant, and 5 per cent. of the quartan *Hæmamœbæ*.

The experimental inoculation of myself and seven others are recorded in the Scientific Memoirs by Medical Officers of the Army of India, Part XII, 1901.

I may be pardoned the transgression of introducing these remarks on malaria, but they have a most important bearing on the subject of akylostoma duodenale amongst the prisoners. The effect of applying leeches to a chronic malarial, would be to abstract blood from the circulation which he could ill afford; hence those internal leeches, the ankylostomata, undesirable guests in the intestine of any one, are specially dangerous to those suffering from anæmia. Even

if, as some have held, the presence of ankylostoma in the bowel were only an undesirable condition that is in this country more or less normal, yet that presence would become prejudicial when the patient is already in the abnormal condition produced by malaria.

III.—ANKYLOSTOMA.

A systematic search for the ova of entozoa amongst the convicts and new arrivals in the Central Prison, Rajahmundry, was commenced in February 1900, and continued till November of the same year. Those examined came from the Northern Circars, which include Ganjam, Godaveri, Vizagapatam and Kistna districts. Prisoners also came from Kurnool and the hilly tracts of the East Coast. Altogether over 1,500 new arrivals had their motions examined, and, in addition to these, 300 convicts who had been confined for six months and upwards in the jail. This laborious task was performed by me personally, and, as a rule, three slides were carefully scrutinized.

Ankylostoma.—Of the 1,509 new arrivals, 883 or 58·87 per cent. harboured this blood-sucking nematode, that is to say, that more than half the population of this part of India are affected by this parasite.

Of this large gang of prisoners, 60 per cent. arrived in good health, and 40 per cent. in bad and indifferent, the numbers being as follows:—

Prisoners in good health = 894
" " indifferent health = 406
" " bad " = 209

From the accompanying tables, it will be observed that over 53 per cent. of persons in the Northern Circars harbour this nematode, and still remain in good health. It would be expected that the better hygienic surroundings of the prison and the strict supervision as to the cleanliness in the preparation of the food would have produced a material reduction in the numbers affected. Not so, the percentage remains the same, *viz.*, 58 per cent. as demonstrated in the analysis attached of 200 convicts who have served six months and upwards in the prison. The examination brought this fact to light, namely, that the ova are far more numerous in those who are in bad and in indifferent health. This numerical superiority indicates that the parasites are more numerous and are an important factor in the decline in health of the individual harbouring this parasite. This point is testified by the analysis of 105 *post-mortems*, which I performed during my tenure of office as Medical Superintendent, in that the percentage of parasites present has risen from 58 per cent. to nearly 75 per cent. The bowel of those affected shewed the presence of small congested areas from one to several centimetres in diameter and the mucus was thickly streaked with blood.

Total number examined.	Ova of ankylostomaoides.	Ova of ascaris lumbricoides.	Ova of trichocephalus dispar.	Ova of tapeworm.
Number 1,509 ...	883	633	131	3
Percentage ...	58·87	42·2	8·7	·20

Health of the convicts harbouring Ankylostoma Duodenale.

	Good.	Indifferent.	Bad.
Numbers affected ...	475	229	179
Percentage... ...	53·8%	25·8%	20·4%

Double infection with A. Duodenale and A. Lumbricoides.

Total examined.	Double infection.	Health good.	Health indifferent.	Health bad.
Numbers, 1,509	364	167	101	96
Percentage ...	24·5	45·7	27·7	26·6

Ages of persons harbouring Ankylostoma.

Number of persons whose age was recorded.	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60
841 ..	55	261	247	144	134
Percentage. ...	6·54	31·03	29·38	17·12	15·93

Analysis of 105 post-mortems carried out in Rajahmundry Central Jail.

Cause of death.	Number of deaths.	Ankylostoma duodenale.	Hæmorrhagic spots.	Erosions.
Dysentery	29	25	18	8
Diarrhœa	12	11	7	...
Ague	14	2	9	2
Pneumonia	17	14	10	...
Tubercle of lungs	8	7	5	...
Valvular disease of heart ...	5	4	3	1
Disease of liver	3	2	2	...
" of kidney	13	11	9	1
General diseases	4	2	2	...
TOTAL ..	105	78	65	12
Percentage ...	...	74·3	51·9	11·4

Analysis of 200 convicts who have served 6 months and upwards.

	Ankylostoma.	Ascaris lumbricoides.	Trichocephalus dispar.
Number of cases in which ova was present	116	37	10
Percentage ...	58·0	18·5	5

Nearly 52 per cent. of the *post-mortems* disclosed these congested spots, while in 11·2 per cent. small erosions and ulcers about 1—3 mm. in diameter were present.

These figures, as well as the experience gained in the jail after three and-a-half years, go to show that the effects of the ankylostoma are for the most part secondary and not primary. They seldom occur in such numbers as to cause true ankylostomiasis. I feel convinced that many cases of ankylostomiasis are not the result of the ankylostoma primarily, but of such disorders as malaria, dysentery, &c. The presence of ankylostomata in malarial or other cachexias is of great importance. They bleed the patient who can ill afford to lose the blood, and set up local congestions and erosions of the bowel which cause a catarrh and thus retard the proper assimilation of the food and recovery of the patient. It is this secondary effect of ankylostoma that I look upon as most injurious.

It has been stated that pigmentation of the tongue occurs amongst those harbouring ankylostoma duodenale. I find that pigmentation occurs in about equal numbers amongst those affected and those free of the nematode as exemplified in the accompanying table.

List of convicts affected with Ankylosotma treated by Thymol and occasional purgatives.

Number of convict.	Period treated by Thymol.	Dose of Thymol daily.	REMARKS.
	Days.	Grains.	
994	10	20	Ova as numerous at the end of treatment as at the beginning.
970	17	20	
9635	27	20	
767	24	20	
1305	15	30	
9708	30	20	
629	30	20	
774	30	20	
743	30	20	
9708	30	30	Second period of treatment.
9711	30	30	
774	30	30	Second period of treatment.
743	30	30	Ditto ditto.

Pigmentation of the tongue.

Prisoners affected with Ankylostoma.		Prisoners free from Ankylostoma.	
Number examined.	Number with pigmented tongue.	Number examined.	Number with pigmented tongue.
392	87	356	89
	22·2%		25·4%

In regard to thymol observers state that it is the most useful drug we have for this organism. There is sufficient evidence to prove that it rids the bowel of a large number of them if they are fairly numerous: but I doubt if it will entirely evacuate all. I have notes of thirteen cases who have been consuming large doses of thymol for varying periods from 10 to 60 days, and in whose motions the ova of ankylostoma duodenale were still present at the end of the treatment.

For the diagnosis of ankylostomiasis, therefore, it is necessary to exclude all other blood-destroying diseases rather than depend on the mere presence of this parasite in the bowel.

Ascaris Lumbricoides.—This parasite has been fully dealt with in my paper on Cannanore Central Prison. In Rajahmundry Jail 42·2 per cent. of the new arrivals were found to harbour this nematode, and 24·5 per cent. were found to suffer from the ascaris as well as ankylostoma. The effect of prison life as regards hygiene and clean food is most marked, since the percentage amongst 200 convicts (Table attached) who have served six months and upwards of their term, falls from 42·2 to 18·5 in respect of ascaris lumbricoides, whereas the ankylostomata figures remained stationary for both, namely, 58 per cent.

Trichocephalus dispar appeared in 131 out of the 1,509 examined, *i.e.*, about 9 per cent.

The conclusion thus arrived at is that the ill-health of this jail has been due to the combined prevalence of malarial fevers, ankylostoma and ascarides with their sequelæ pneumonia, dysentery, phthisis, &c., which is well illustrated by the fact, previously alluded to, that in 293 necropsies (1887-96) tubercle of the lung was found in 61 cases and ulceration of the bowel in 116. I do not mean to convey the impression that beri-beri does not exist in the Northern Circars. My time has been spent wholly in Rajahmundry, and I have no experience of other parts of the area known as the Circars. Still prisoners come from all parts of that area to the jail, and the population I have had to deal with is fairly representative. It is left for some enthusiast to find how far the new organisms of Donovan and Leishman affect the health of the population on the East Coast.

To sum up the conclusions suggested in the foregoing paper, the view which attributes the ill-health of the Rajahmundry Central Jail to beri-beri is contradicted by the following facts:—

I. There is no evidence that beri-beri is endemic in the Northern Circars except Dr. Malcolmson's statements, and his book written in 1835 is now obsolete and unreliable.

II. Deaths have been returned as beri-beri which are proved by the lesions found at *post-mortem* to have been due to other diseases.

III. The beri-beri heart is conspicuous by its absence, and there has been no undue hypertrophic influence on the cardiac muscle.

IV. The "Numbness and Burning" sensations of the feet, if taken to denote peripheral neuritis, have been found in diseases in which it is not known to occur, and are therefore an unreliable proof of nerve degeneration amongst the prisoners.

V. The total absence of paralysis.

VI. The sanitary incident of the year 1887 is explained by the discovery of ankylostoma duodenale, beri-beri being at that time supposed to be due to ankylostoma or to have a connection with it.

VII. The malarial parasite, ankylostoma duodenale and ascaris lumbricoides, each capable of causing excessive sickness, and mortality have been found is this jail to be associated together in many individuals and are thus doubly fatal in their effects.

INTESTINAL ANIMAL PARASITES IN BIHAR AND ORISSA.

By CLAYTON LANE, M.D. (Lond.)
Capt., I.M.S.

The following details of the prevalence of intestinal parasites were collected mostly by the microscopic examination of the stools of prisoners in the Chupra and Puri Jails. This examination was carried out as follows:

A little of the stool was picked off with a thin piece of stick and placed on a microscopic slide, and a small quantity of water added, the amount of each used being such as experience showed to produce a regularly disposed film of fæcal granules, thin enough, after the superposition of a cover-glass, to insure that the details of the ova were not obscured by other material, but at the same time so concentrated that the largest amount of fæces, compatible with this consideration, was passed under observation. The examinations were mostly carried on as a routine measure on prisoners soon after admission, but some cases were also investigated to ascertain, if possible, the cause of loss of weight. The lenses used were mostly a Zeiss A with No. 4 ocular, and three slides were examined in all but the first few cases.

The results arrived at were these :—

Intestinal Parasites.	Chupra Jail, 153 prisoners examined.		Puri Jail, 44 prisoners examined.	
	Actual numbers	Percentage.	Actual numbers	Percentage.
Uncincaria duodenalis ...	109	71·24%	32	72·72%
Ascaris lumbricoides ...	91	59·47%	19	43·18%
Trichocephalus dispar ...	15	9·8%	6	13·64%
Oxyuris vermicularis ...	5	...	5	...
Tænia solium ...	4	2·61%	0	...
Rhabdomena larvæ ...	2	1·3%	7	15·91%
Tænia nana ...	1	0·7%	0	...
Tænia flavo-punctata ...	1	0·7%	1	2·27%

In the Chupra cases there were 79 instances of infection by two species of parasite, in six cases by three, and in one case by as many as five, these being ascaris, uncinaria, trichocephalus, oxyuris, and rhabdomena, and 88·24% of the prisoners harboured parasites. This estimate is too low, for the cases in which no ova were found occurred largely at the beginning of the investigation, and the inability to find them was evidently largely the result of inexperience.

In Puri 93·18% of the prisoners were found affected, probably a correct estimate; 25 harboured two species of worms, two harboured three species, and one four species.

Uncinaria duodenalis.—The colourless uncinaria ova were found in about 72% of cases both at Chupra and Puri. The amount of segmentation which they showed varied in the most marked way, and was on the average considerably greater in Puri than in Chupra; but the size of the ova bears no relationship to the amount of segmentation; indeed, the largest ova measured were those with four segments. The earliest stage of segmentation recognised was that in which the ovum had just begun to divide for the first time. The first line of fission takes place transversely at a point situated about one-quarter of the length of the long axis from one pole, so that the ovum consists of two segments, one large and one small (Fig. 1). A similar fission takes place at the corresponding point near the opposite pole of the ovum so that three segments are formed. The equatorial cell then divides in the long axis of the ovum, and the appearance may be either that depicted in Fig. 2, A or B. In the latter the ovum looks exactly like that containing three cells only, but it may be distinguished by rolling over the ovum, an effect produced by moving the cover-slip, and as this motion brings another aspect of the ovum to view, the four cells composing it can be distinctly seen.

The next step in segmentation is a transverse division of one of the equatorial cells, so that the polar cells tend to be pushed out of the long axis of the ovum (Fig. 3). The next line of cleavage appears to be in cell marked "a" in this figure and to be in the long axis of the ovum in a plane parallel to the paper as the ovum is depicted in the diagram.

An unusual form of segmentation is one in which, after the stage of four segments is reached, there is a fission of them all in the long axis of the ovum, so that eight segments are formed, in two layers of four each, each layer being similar to the other. The further details of fission are difficult to follow, but finally the ovum may be passed in the fæces as a morula consisting of many small cells (Fig. 6). No larvæ either within or without the shell were ever found.

It is a remarkable fact that, as noted above, and, speaking generally, the amount of segment-

ation undergone by ova in the alimentary canal of the host was definitely greater in Uriahs in Puri than in Biharis in Chupra. In Puri the average number of ova found in three slides was six. All these men, with the exception of two, were examined as a routine measure within a few days of admission to jail, irrespective of whether they were in good or bad health. The two exceptions were, firstly, a man examined during recovery from dysentery whose fæces showed amœbæ and seven rhabdonema larvæ; and, secondly, a lunatic with high fever and marked anæmia, in whose fæces four uncinaria ova were found.

As stated above, uncinaria ova were found in about 72% of all cases irrespective of their state of health. It is at this point that one is faced by the difficulty of determining under what circumstances one is to consider the parasite as a serious factor in the causation of disease. The case in which the largest number of adult worms was found in the fæces after treatment by thymol was in a man who was classified as being in good health. He had three 20-grain doses of thymol at hourly intervals after the bowels had been prepared by purgation and a milk diet, and he passed 59 uncinariæ. This matter will be touched upon again in the consideration of ascaris infection.

With reference to the prevalence of uncinaria in different parts of India, the following figures from the Annual Reports of the Director-General for 1899, 1900, and 1901 are of interest. In Rajamundry prison, as reported by Captain Fearnside, uncinariae occur in from 68 to 74% of prisoners. In the Andamans Penal Settlement the S. M. O. reports in 1899 76% as affected; in Durbhanga Captain Calvert, 83%, and Lieutenant-Colonel Grainger and Captain Gwyther, 90·84%, and in Dacca Lieutenant-Colonel Campbell, 12·64%.

Ascaris lumbricoides.—It appears to be far from generally recognised, although diagrams and hints in descriptions show that this is by no means an original observation, that the ova of ascaris are of at least two kinds, in both of which the shell is stained a deep yellow colour.

There is firstly the variety usually described (Fig. 7 A). In this the yolk is fairly finely granular though coarser than in the case of uncinaria ova, and slightly oval, being about 50μ long by 46μ wide, and is in part retracted from the shell, leaving a space of 5μ or more between the two at one pole.

The shell is of two parts, an inner even laminated zone usually about 2μ in diameter, and an outer closely adherent to this, but rising externally into excrescences producing a rugged outline, and quite irregularly disposed except that they have a tendency to arrange themselves near the poles so as to form a polar crater dipping down to the inner shell. If the shell is burst by pressure the colourless granular yolk escapes, the size of the granules being such as would be expected from the appearance they present through the shell (Fig. 7 B). The nodular shell sometimes gives a false optical appearance of coarse granulation of the yolk, but the real condition can be ascertained at once by rupturing the former.

Secondly, there is a longer variety (Fig. 8 A), the yolk being about 100μ long and about half that width, and being made up of large granules or globules as much as 10μ in diameter. The shell is thinner than in the first described variety, but consists of the same two layers. Its outer surface has not, however, the same rugged character, the prominences being smaller, but it shows the same tendency to the formation of polar craters. That the very coarse granulation is not an optical effect produced by the irregularity of the surface is shown by its presence in those rare instances in which part of the shell has become broken off leaving the yolk unruptured; and also by the fact that if the ovum be deliberately broken by pressure and the contents forced out of the shell, the escaping yolk aggregates into still larger globules which may be as much as 16μ in diameter, a size which does not appear to be reached within the intact ovum. The proportion of the barrel-shaped ova to the usual type was about 1 to 6 in Puri.

There has been some discussion lately in this and other journals as to the pathological effects of these parasites, so that the following facts may be of interest. It does not appear that any facts have been brought forward to indicate that the dissolution of the food in the process of digestion is materially affected by the presence of intestinal parasites, yet this is undoubtedly the case. In examining the fæces of prisoners in an Indian jail, it is a striking fact that there are to be found a considerable number of undigested *dal* granules in the microscopic field; so constant is this that the absence of them immediately attracts the attention, and further investigation shows that the absence of parasitic ova and of undigested *dal* granules is in striking relationship. When the fæces of a man do not contain parasitic, ova, the fæcal material consists almost entirely of fine granules, appearing as points under the high power. When parasitic-ova are present, undigested *dal* granules are also in marked evidence. It appears then that the presence of intestinal parasites causes the action of the digestive juices to be inefficiently carried on. This may be possibly due to the mechanical effects of the parasites, the irritation of their presence causing inflammation of the mucosa with alteration of the fluid secreted by its gland cells; or possibly to poisons secreted by the worm and either injected into the mucosa as in the case of uncinaria; or excreted into the alimentary canal of the host, and there acting directly on the digestive ferments, or being absorbed into

the gland cells and interfering with the proper secretion of the ferments as in bothrio-cephalus anæmia. But at all events, in whatever way the effect is produced, the fact that the presence of intestinal parasites prevents the proper action of the digestive ferments is a very valuable indication of the necessity for getting rid of them, particularly in those who are weakly or are losing weight. This effect is attributable to ascaris in common with all intestinal parasites.

It can, moreover, hardly be doubted that the mechanical effect of ascarides wriggling about against dysenteric, typhoid and tubercular ulcers must be in the extreme injurious, another argument pointing to the necessity for their detection and removal.

Clinical experience appears also to show definitely that ascarides can produce fever. The regularity with which it is found at the Eden Hospital that puerperal native women, who have a rise of temperature without any local or general signs of sepsis, are immediately cured by a dose of santonin and castor-oil with the evacuation of round worms is too marked to be the result of mere coincidence.

A glance through the annual reports of the Director-General for a series of years will show that the number of deaths in the jail population attributed to ascarides is not so small as might be imagined. The following occurred under my own observation. A prisoner in the Chupra Jail was seized with vomiting, diarrhœa, and collapse, and died within 48 hours, having been quite well previously. At the *post-mortem* examination there was general peritonitis, and 18 inches above the ileo-cæcal valve a small perforation about the size of a No. 4 catheter. In the peritoneum over the left iliacus muscle was an opening leading down to a cavity in the iliacus muscle itself, and occupying this cavity was a living ascaris. The internal coat of the intestine was healthy except for the perforation mentioned, and within the gut were found six more round worms. Since the ascaris in the iliac muscle must undoubtedly have got there from the peritoneal cavity by its own burrowing powers, there seems no reason for doubting its capability of making the hole through which it escaped from the bowel. I know of two similar fatalities in the practice of others, so that the effect cannot in this country be considered as a pathological curiosity, but rather as a indication for the urgent necessity of getting rid of all ascarides.

It has been stated above that there are two varieties of ascaris ova. What is the significance of these two varieties, whether it is sexual, or bears some relationship to the power of resistance to desication or has yet some other meaning, I am unable to say. On dissecting female ascarides, I have found all the ova within the oviduct about the same size, namely, 80 by 40μ, and all apparently fairly finely granular, and all also apparently without a shell. On adding iodine, however, some remain fairly finely granular, in others coarse granulation appears, with a faintly stained outer shell having the exact features of the coarsely granular variety. This outer shell has evidently the same refractive index as water and so is not visible without staining. Two such stained ova from the same oviduct are seen in Fig. 9, A & B.

Rhabdonema larvæ were found in 3 per cent. of the Chupra prisoners and 16 per cent. of those in Puri. The usual numbers found were one to four in three slides. In one case there were as many as 40. In this case there were found ova which can hardly have been other than those of rhabdomena (Fig. 10). They were oval, measuring about 70 by 50μ. The shell was double, and in one the outer shell had a double outer contour. In another the yolk had shrunk away from the inner wall of the double shell, leaving a space within the double shell, showing that the presence of a double shell was an actual condition and not an optical illusion due itself to shrinkage of the yolk. The shell was of steel blue colour, in marked contrast to the yellow or brown bile-stained shell of the ascaris ovum. The yolk had a granulation of medium fineness such as is met with in the ordinary type of ascaris ovum. At either pole was an irregular brown mass; evidently the remains of the strand which connects the string of ova in the mother. This man had in addition to the 40 larvæ, three barrel-shaped ascaris ova, and 40 uncinaria ova.

Trichocephalus dispar does not appear to be a prolific parasite, the largest number of ova found being three. It is commoner in Puri than in Chupra.

The ova of oxyuris vermicularis were not recognized in the fæces in any case, but the adults were found in all cases in Puri in which thymol and purgatives were given for the evacuation of uncinariæ. They appear then to be among the commonest of the intestinal parasites. Living as they do in the large intestine they can scarcely fail to have an injurious effect on dysenteric lesions.

Hymenolepis Murina (Tænia Nana).—This tapeworm of the rat and other rodents showed its presence by its ova in one case in Chupra. The ova with their thick non-striated shell and stout hooks have no resemblance to those of the common tapeworms. This strobilus has been described as occurring as a human parasite in Egypt, Italy, Buenos Ayres and in Siam, but apparently not in India. It has evidently a wide distribution, and will doubtless be found oftener in tropical countries if looked for. Probably its small size, 10 to 15 mm., has prevented its more frequent discovery. This actually occurred in the case in question, for the hospital assistant, not finding anything large in

the stools, and not understanding that the worm was minute, threw them away without waiting to have them strained.

Tænia Flavo-punctata.—The ova of this rare cestode were found in two and possibly in three cases; the last is uncertain because only the embryo was found without the thick three-layered shell. Of the two definite cases one occurred in Chupra and one in Puri. The appearance of the ovum is quite distinctive and cannot be mistaken for anything else (Fig. 11). The shell was of a deep yellowish brown colour when seen unbroken. In optical section, there was an outer striated layer, within this an inner homogeneous narrow layer and within this again a third layer forming a broad homogeneous band about 20μ in width. Lying in the centre, and separated from the last mentioned structure by a slight space, is the six-hooked embryo. The hooks are large and characteristically sickle-shaped, springing from a central knob or bulb, and so situated that the two middle ones lie in the short axis of the oval. The outside measurements of the ova were 75 by 70μ and the diameter of the embryo 33μ. On rupturing the shell and forcing out the embryo it was seen to be colourless, as was the broad homogeneous band. The striation of the outer shell was evidently caused by the latter being made up of a number of prisms set side by side. In neither case did anthelmintics have any effect in producing the evacuation of the strobilus. The Puri prisoner, on being offered a reward if we succeeded in dislodging and securing his tenant, became actively interested in the matter, but was extremely chagrined on being assured that three drowned beetles, which he triumphantly showed us in his stool, were not at all what we were so anxious to find. Against such misdirected zeal one has always to be on one's guard in a jail. This parasite, the strobilus of which is about a foot long, does not seem to have been described as occurring in India, nor is anything known as to its life history, a fact which makes the non-recovery of the strobilus the more regrettable.

Owing to the failure to recover the strobili of these two rare parasites, it cannot be claimed that their presence has been definitely demonstrated in India as human parasites; although it is practically certain that this is the case, in view of the fact that in the case of the Puri prisoner the slides and coverslips used had been kept in spirit after treatment with strong acid, so that they could not have been accidentally contaminated by the excreta of some other animal. The discovery of the ova points at least to the presence of the parasites in India, and there appear no reason to doubt that their demonstration as human parasites here is only a matter of time, the possibility of their lodgement having been pointed out.

Amœba coli.—No particular attention was paid to the prevalence of the amœba coli or of other protozoa till close to the end of the investigation, when they were found present in thousands in 3 slides taken as a routine measure in a prisoner admitted in "good" health. On questioning him he said that he had had dysentery badly a month and a half previously. In this and the next eight cases, the last of the series, amœbæ were found in varying numbers in 6. In three of these cases the numbers were one, "a few" and "a good many" respectively, and these men had never had dysentery. In the other three the numbers were noted as "thousands," "a large number" and "large numbers." The first case has been mentioned, the second had had dysentery badly for ten or twelve days the previous month, and the third suffered from chronic dysentery with occasional frequent motions and mucus in the stool.

The amœbæ varied from 10 to 26μ in diameter, and occasionally showed amœboid movement. Sometimes they were greenish with a very sharp outline and highly refractive edge and no internal details to be seen (Fig. 14 C.). Others had a fine outline and internally 1 to 6 nuclei in a granular protoplasm. (Fig. 14 A. B.). The former is probably the encystment stage capable of resisting desication and other injurious influences.

The bodies pictured in figures 12 and 13 appear to be ova but were not identified.

The conclusions to be drawn from these facts are briefly as follows: In India nearly every native, of the lower classes at least, harbours parasites in his intestines, and more than half of them have more than one species. What may be called the primary evil effects of these parasites, such as the blood-sucking properties of uncinaria and the boring properties of ascaris, though they may give rise to the most serious results, yet usually do not do so. The effects which are on the whole the worst, because they are more widespread are the secondary ones, namely irritation of the intestinal canal and interference with the proper action of the digestive juices, and these effects are of vital importance in all debilitated conditions, particularly those caused by diseases of the intestines. Personal experience confirms this, for the treatment of cases of parasites, when the numbers of ova were large, combined certainly with the issue of finely ground flour to the prisoners at Chupra, resulted in a reduced general admission rate to hospital (in spite of the fact that all cases treated were shown in the returns as admissions), and a small death-rate accompanied by the same effects in respect to dysentery, but in a more marked degree There is, however, the fallacy to be remembered, that the figures were for one year only, and the good health may have been due to some other cause. At least the results seem sufficiently encouraging to warrant repetition of the considerable labour entailed in the search for ova of intestinal parasites.

Indian Medical Gazette, April, 1904.

INTESTINAL ANIMAL PARASITES IN BIHAR AND ORISSA.

By CLAYTON LANE, M.D. (Lond.), Capt., I.M.S.

Fig. 1.

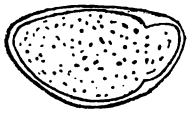


Fig. 2.

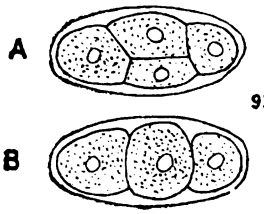


Fig. 3.

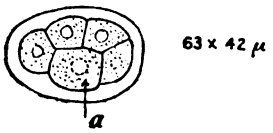


Fig. 4.

Fig. 5.

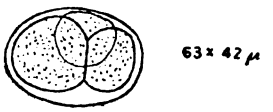


Fig. 6.

Fig. 7.

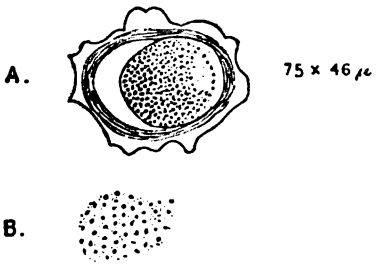


Fig. 8.

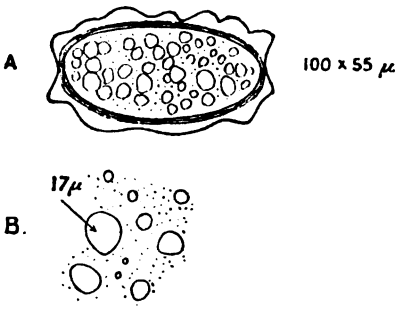


Fig. 9.

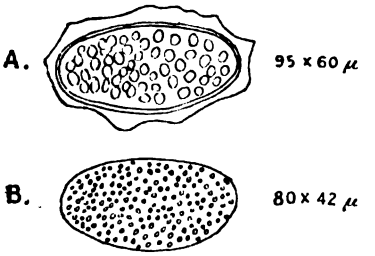


Fig. 10.

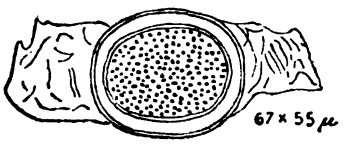


Fig. 11.

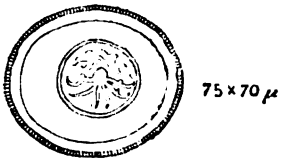


Fig. 12.

Fig. 13.

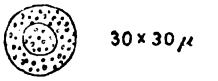
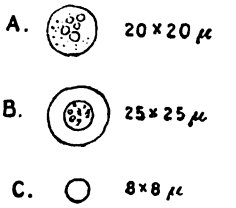


Fig. 14.



Figs. 1—6. Ova of uncinaria duodenalis in various stages of division in fæces.

Figs. 7—8. Ova of ascaris lumbricoides in fæces.

7A. The ordinary form.
7B. Yolk expressed from 7A.
8A. The barrel-shaped form.
8B. The yolk expressed from 8A.

Fig. 9. Two ova stained with iodine, obtained by section of the oviduct of a single female ascaris lumbricoides.

Fig. 10. Ovum of rhabdonema intestinale in fæces.

Fig. 11. Ovum of tenia flavo-punctata in fæces.

Fig. 14. Various amœbæ in fæces.

Figs. 12-13. Unidentified ova.

SOME NOTES ON ANKYLOSTOMIASIS IN ASSAM.

BY CHARLES A. BENTLEY, M.B.,

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IT has been well-known for many years that ankylostomiasis was exceedingly prevalent among the population of Assam. Giles, Dobson, and Rogers have shown that among villagers in Assam the number of persons harbouring the ankylostoma was often 60% to 75%. Dobson has specially enquired into the prevalence of this infection among immigrant coolies, and has given figures as high as 80%. Among coolies that have been resident for some years infection is the rule. The widespread existence of ankylostomiasis among tea garden coolies has received such general recognition that the term "anæmia of coolies" is frequently used as a synonym for this condition. Some time ago, wishing to make an estimate of the proportion of coolies in the Tezpur District who harboured ankylostoma, I made a microscopic examination of the stools in about six hundred cases.

The individuals chosen were not specially selected as likely to harbour the worm, but were cases of all kinds including many healthy people. Only one out of the six hundred showed freedom from infection.

The remarkable prevalence of this infection is also shown by the fact that in the course of some fifty *post-mortems* upon natives in this part of Assam, I have so far failed to meet with a single instance in which ankylostomes were not present.

Symptoms—Anæmia, digestive disturbances, dropsy and circulatory troubles are generally spoken of as being the distinguishing symptoms of ankylostomiasis. They are not necessarily present, as far as my experience goes, in the majority of cases of infection by ankylostome.

The symptoms appear to me to resemble those of any secondary anæmia, and vary according to the severity of that anæmia. It is quite impossible to diagnose ankylostomiasis by clinical symptoms alone.

Anæmia from many causes is such an exceedingly common condition among garden coolies, that it is only by finding the presence of very numerous ova of the ankylostoma in the stools, that one is justified diagnosing "ankylostomiasis."

The number of worms harboured by an individual varies very much. One man may only act the host to six or eight, while another will support many hundreds. It is quite impossible to estimate from the degree of anæmia present or from other clinical symptoms, whether few or many worms are present in the intestine. In cases which on treatment were found to have harboured several hundred or over a thousand worms, I have often remarked considerable emaciation. This, however, is not a constant ymptom.

Mode of Infection.—In 1901, as a result of a series of experiments, I was able to show that the "ground-itch" so common among tea-garden coolies during the wet months of the year, was produced by the passage of larval ankylostomes from fæcally infected soil, through the skin of the foot of the individual attacked. Looss, who had previously demonstrated the possibility of this passage, has since proved that infection of the intestine, afterwards, results. His idea is that the larval worm passes through the tissues to the small intestine, where it reaches maturity.

Other workers have confirmed these facts, and this mode of infection is now recognised generally as an alternative to the old theory of infection by the mouth. I do not think that this latter occurs except in rare instances. I have never been able to discover larval ankylostomes in well water supplied to coolies in this part of Assam, and nowadays where there are good supplies of water the coolie does not drink from *hoolahs* which might be contaminated.

Two facts which appear to me to have considerable bearing upon this question of mode of infection are young children, who almost invariably harbour round worms, appear to be less liable to ankylostomal infection than adults, I am referring now to children of from one to two years of age. Adults, while invariably harbouring ankylostoma, show a comparative freedom from round worms. Of course many coolies harbour both parasites; but here, about 30% only of adults show infection by the latter parasite. Now it is well known that young children are inveterate earth-eaters; neither are they particular from what source that earth is derived.

Also they are accustomed, while sprawling over the ground, to put into their mouths any object which takes their fancy. It is not surprising then that they should contract round worm infection, for the eggs of that nematode easily resist drying and must be present near the dwellings of all coolies. Adults, on the other hand, are very much more careful in their habits, having, it is true, crude but yet distinct ideas of cleanliness, and being extremely particular about the use of their left hand, etc., and other things which, to their minds, might appear liable to fæcal contamination. (I do not refer to water, because the native believes that water purifies all things by virtue of its inherent properties.)

Although the eating of certain kinds of earth is very common among all classes of coolies, the majority take it in the form of baked clay. Others who eat kutcha earth, generally take it from some special place free from chances of contamination. I have never found ankylostomal larvæ present in the special kind of soil which coolies are known to eat. Among certain coolies, weak-minded or depraved, I have known a few individuals who would eat earth gathered by them from the very spots

which they and other people frequented for attention to calls of nature. These cases, however, are the exception.

I consider the eating of earth or brick, etc., as a symptom common among debilitated and anæmic coolies, indicating digestive troubles rather than the presence of ankylostoma in the intestines.

Treatment of ankylostoma infection.—Many writers upon this subject have expressed a wish for a safe and efficient anthelmintic, to replace the dangerous, though classical treatment by either thymol or male-fern.

For the past two years I have abandoned the use of these drugs in the treatment of ankylostomal infection, using in their place beta-naphthol.

This drug I have found more efficacious and at the same time safer to use than any other remedy with which I am acquainted.

I have now administered it to several thousand cases with excellent results. Before adopting it, I tried by means, of a series of experiments, to ascertain the most efficient among several vermicides. Naphthaline I found to be efficacious but unpleasant, and could not obtain a supply of sufficient purity to satisfy me.

Orthoform (tri-brom-pheno-bismuth) had little effect, and so had benzo-naphthol. Four drugs which appeared most useful were beta-naphthol, thymol, pulv. arecæ, and extract of filix mas in the order given.

My method of testing these drugs was by comparing their effect against thymol as a standard, given in two doses of grs. 30 each, in the usual manner.

I experimented at the time of year when re-infection appeared least likely, that is, about the middle of the dry season.

Twenty-four men were selected from cases appearing to require treatment. To six of these thymol was administered in the ordinary way, and the stools were carefully washed and expelled worms counted. To six other cases extract of male-fern was administered in doses of from drachm 1 to 1½, twice. Six other cases were treated by two ½-oz. doses of powdered areca nut, and six others by two doses of 15 grs. of beta-naphthol.

In each case the patient was prepared in the same way, by liquid diet and an initial purgative.

Fourteen days afterwards, each case was subjected to a second course of treatment; this time with thymol in each case. The results were very carefully checked, but unfortunately I have mislaid the record, so that I cannot here give the figures obtained.

It was found, however, that a very much smaller proportion of worms was expelled from the cases that had previously been treated with beta-naphthol than from any of the others. Thymol appeared to be second best, and powdered areca and male-fern about equal.

It will be noted that in these tests beta-naphthol was given in 15 gr. doses as against thymol in doses of 30 grs.

This smaller dose I find quite sufficient. I never give more than 20 grs. of beta-naphthol repeated in a few hours by a second dose.

By this treatment I have been able to expel in a number of cases from five hundred to over a thousand worms.

This in itself is evidence of the value of this drug as an anthelmintic.

To summarise its advantages, I may point out that it is much pleasanter to take than thymol or male-fern. It may be used in smaller doses. It is equally or more efficient than other remedies. It is already recognised as a useful drug in the treatment of various diseases of the intestines, and also as of service in pernicious anæmia. It is not so irritating to the alimentary canal, neither does it produce the unpleasant giddiness associated with the use of large doses of thymol. Lastly, it is only about one-tenth the price of thymol.

After treatment of ankylostomiasis cases.—Good dieting is the chief essential, combined with the exhibition of a mixture containing sulphates of iron and magnesia, or by a course of Blaud's pills. A bi-weekly dose of some saline purgative is nearly always essential during the course of iron.

N.B.—As a help in diagnosis, I may mention that from my experience an increase in the eosinophile leucocytes in a differential blood count, is a valuable indication of infection by ankylostoma and other worms.

A NOTE ON THE OCCURRENCE OF INTESTINAL PARASITES IN RANCHI, CHOTA NAGPUR.

BY CAPT R. H. MADDOX, M.B., I.M.S.,

Officiating Civil Surgeon, Ranchi.

THE following notes are based upon an examination of the stools of new admissions to the District Jail and therefore relate to adults only of whom all but two or three were males.

Three slides were prepared from each stool from parts as far from each other as possible and examined under the microscope as once :—

TABLE I.

Year.	Total number stools examined.	Ankylostomum Duodenale.	Ascaris Lumbricoides.	Oxyaris Vermicularis.	Tænia Solium.	Trichocephalus Dispar.	Total number containing parasites.
1903	266	169 or 63·5 p. c.	17 or 6.4 p. c.	9 or 3·4 p. c.	2 or 0·75 p. c.	1 or 0·35 p. c.	198 or 74·40 p. c.
1904	100	75	8	5	1	...	89
Total	366	244 or 66·6 p. c.	25 or 6·8 p. c.	14 or 3·8 p. c.	3 or 0·8 p. c.	1 or 0·27 p. c.	287 or 78·27 p. c.

The result of the examination is set forth in Table I, one stool from each individual only having been counted. The two years 1903 and 1904 up to the middle of February are shown separately as, owing to an absence from the district, I only examined about half the cases in 1903 myself.

Ankylostomum Duodenale.—Of the 244 cases in which the ova of this parasite were found, seven cases only presented any marked anæmia; these were treated with thymol and the worms collected from the subsequent stools, but the number obtained were on the whole disappointing. The anæmia was never very severe, and it cannot be said that any of the cases suffered any serious inconvenience from the presence of the parasite.

Ascaris Lumbricoides.—In all the 25 cases in which the ova were seen, santonin was given and one or more worms expelled.

Tænia Solium.—All the three cases were first diagnosed by discovery of the ova in the stool, the patient not having complained of it until questioned. They were treated by male fern and the worm expelled.

Oxyuris Vermicularis.—In all these cases the diagnosis was first made from the presence of the worms in the stools, the ova being seen subsequently on microscopical examination.

Trichocephalus Dispar.—This appears to be uncommon in this district, whereas in a much smaller series of observations in Calcutta I found many more.

No attempt was made to count the number of ova present in each slide, but as a rough guide to the total number present a note was kept in the 100 cases examined in 1904 as to the number of slides which contained the ova of each of the two commonest forms; the result of this is shown in Table II.

TABLE II.

ANKYLOSTOMUM DUODENALE.				ASCARIS LUMBRICOIDES.			
In 1 in 3 slides.	In 2 in 3 slides.	In all 3 slides.	Total stools examined.	In 1 in 3 slides.	In 2 in 3 slides.	In all 3 slides.	Total stools examined.
27 or 36·0 p. c.	16 or 21·34 p. c.	32 or 42·66 p. c.	75	2 or 25·0 p. c.	2 or 25·0 p. c.	4 or 50 p. c.	8

This table seems to show in a general way that in most of the cases when ova were present at all, they probably pervaded the whole stool, as each slide was prepared from different portions of the same stools as far apart as possible.

General conclusions.—As a number of the inhabitants of this district have served as coolies in the Assam tea gardens, a note was kept of those who had ever been there, but out of 366 persons whose stools were examined only seven had been in Assam, so that it does not seem likely that Assam has very much to do with the infection of inhabitants of this district, at any rate at the present time.

From the observation of these cases it does not appear that the presence of intestinal parasites, more especially of the ankylostoma, produces much actual disease or even inconvenience in adults. The only circumstance which was generally noted was that ova were more likely to occur in the more liquid stools than in the more formed ones.

As regards treatment those who were treated frequently expressed themselves as having benefited, and cases of ankylostoma did decidedly improve after removal of the parasite and appropriate diet and medicinal treatment. With regard to the general population it is very difficult to obtain any statistics, especially among children. The annual reports of the Ranchi Dispensary show that rather more than 5 per cent. of the out-patients were treated for "worms" during the last 10 years.

In making the above observations I have received great assistance from Civil Hospital Assistant Suresh Chandra Chatterji in charge of the Jail Hospital in preparing and examining the stools and recording the results.

A Mirror of Hospital Practice.

SIX CASES OF TETANUS.

BY JOHN SMYTH,
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Victoria Hospital, Bangalore.

I.—NANJAPPA, a Hindu male, aged about 60, was admitted into the hospital on 13th February 1903 for compound fracture of left tibia and fibula. The wound began to slough and gangrene set in the limb, which was amputated on 17th February 1903. The stump began to slough, and symptoms of tetanus developed on 3rd March 1903. The patient was put on serum treatment. He had 14 injections of antitetanic serum of 10 c. c. each every eight hours.

Under the serum treatment the spasms became less frequent and gradually they passed away. The patient made a good recovery and was discharged cured on 20th June 1903.

II.—Sundaramma, a Brahman female, aged about 15, was admitted into the hospital on 21st May 1903 for traumatic tetanus of 14 days' duration. She had a wound on the left thumb, which was almost healed at the time of admission.

She was given three injections of anti-tetanic serum of 10 c. c. each, every eight hours. The spasms, which were very frequent, became less frequent under the serum treatment, and they gradually passed away.

She was discharged cured on the 25th May 1903.

III.—Kondappa, a Hindu male, aged about 40, was admitted into the hospital on 28th May 1903 for traumatic tetanus of four days' duration.

He had a wound half an inch in diameter on the dorsum of right foot. He had three or four spasms an hour; three injections of anti-tetanic serum of 10 c. c. each (every eight hours) were given.

He did not show signs of improvement and died on 30th May 1903.

IV.—Veerabhadrappa, a Hindu male, aged about 18, was admitted into the hospital on 1st October 1903 for traumatic tetanus of ten days' duration.

He had a contused wound an inch-and-a-half long and half an inch broad on the dorsum of left foot.

The spasms were frequent, and the symptoms were well marked. There was trismus, opisthotonos, emprosthotonus and pleurosthotonus.

He was put on chloral and bromide as anti-tetanic serum was not available. The wound on the dorsum of the foot was dressed antiseptically. As the patient did not show signs of improvement he was taken away by his relatives on 4th October 1903.

V.—Mahomed Ibrahim, a Mahomedan male, aged about 45, was admitted into the hospital on 9th October 1903 for idiopathic tetanus of six days' duration.

There was no history of injury in this case. The patient was put on chloral and bromide. As he did not show signs of improvement he was taken away by his relatives on 10th October 1903.

VI.—Ammakannu, a Hindu child, aged about 4 years, was admitted into the hospital on 4th December 1903 for idiopathic tetanus of ten days' duration. There was no history of injury in this case, nor any wound found on her person.

This patient was put on chloral and bromide and was discharged cured on 30th December 1903.

COBRA BITE: RECOVERY.

Muthee, a Hindu female, aged about 36, was brought into the hospital on 23rd April 1903 for cobra-bite. The patient was semi-conscious with almost imperceptible pulse at the wrist and cold extremities. There were three small punctured wounds on the 2nd toe of right foot.

The toe was ligatured, the wounds were incised and washed with Condy's lotion.

Liqr. strychnine, minims 10, was injected hypodermically every five minutes for four doses.

Half an hour after the last injection of strychnine, as coma continued 20 c. c. of anti-venine was injected and after an interval of about an hour another dose of 10 c. c. was injected.

The patient rallied slowly and was discharged cured on 1st May 1903.

A CASE OF ACUTE HÆMORRHAGIC PANCREATITIS.

By ARTHUR T. TORPY,
MILY. ASST.-SURGN.,
R. I. M. S. *Clive*.

R. F., aged 30 years, a Goanese, occupation *topass* aboard the R. I. M. S. *Clive*, reported sick at 8 A.M., on the 12th November 1903, complaining of aches all over the body, loss of appetite and no action of the bowels for 48 hours; beyond a white coating of the tongue, no other symptoms were present. Oleum ricini ʒi, Tinct. opii m. xv, aqua menthæ pip. ʒi, was administered. By 4 P.M. the same day the physic had not acted and patient complained of severe abdominal pains, which patient pointed as being chiefly in the epigastric and umbilical regions; about the same time patient vomited a small quantity of fluid consistency mucus and bile.

On examination, the abdominal muscles were found to be quite rigid, with tenderness on palpation and percussion, the note of latter being dull, especially about the flanks, and the abdomen was quite flat, there being no distension whatsoever; his body surface was quite cold, pulse small and thready, respirations shallow and laboured; patient was in a state of collapse. A stimulant was immediately administered, followed later by a simple enema of one pint, which patient soon expelled together with a small quantity of scybalous fæcal matter, colour yellowish-brown. Patient then lay in bed, and after having turpentine stupes over the abdomen remained quiet, and at 6 P.M. asked for and was given a cup of thin arrowroot congee with half an ounce of brandy. He then slept till 9 P.M. when he was last seen.

At 5 A.M. the next day (13th November) patient was found dead, lying on his stomach with his chin and both arms, the latter at right angles to his body, resting on his pillow. On inquiry two patients in the hospital stated that they saw deceased at 4 A.M., when he lay in bed and assumed the position in which he was found, and that he was to and fro from the latrine since 1 A.M., and stated, when questioned, that he was unable to have a stool; he was very calm and sought no assistance from either of the other patients in the hospital. At 10 A.M. the same day a *post-mortem* examination was held previous to his interment in the deep sea; at which I was very kindly assisted by Lieutenant

Cooke, I.M.S., Medical Officer in charge XIth Rajputs. Rigor mortis present.

Lungs—Congested; no hæmorrhage underneath or on pleura.

Heart—Large, soft and flabby, valves normal, small hæmorrhages on pericardium and heart wall, more especially auricles; no hæmorrhage into pericardial cavity.

Liver—Congested, with hæmorrhagic patches under capsule, especially on posterior surface in contact with diaphragm.

Gall-bladder—Full and distended. Ducts fibrosed, especially at junction with pancreatic duct, but no obstruction to flow of bile into deodenum, nor did it appear that there had been any regurgitation into the pancreatic duct.

Spleen—Dark and firm, contained much blood.

Kidneys—Congested, capsule tore off easily behind, and around both kidneys there was considerable sub-peritoneal hæmorrhage, as also under diaphragm. Urine was not examined.

Stomach and duodenum Normal. No aneurisms.

Abdominal aorta and cœliac axis—Normal.

Pancreas—Increased in size and weight, hard to the feel, resembling some very fibrous structure; the organ itself was found to be much swollen, especially towards its head; with hæmorrhages throughout. Its duct was patent. Hæmorrhage was present in its neighbouring structures to a considerable extent, and there were a number of adhesions binding pancreas and intestines in its immediate neighbourhood; the adhesions were old. There were no patches of fatty necrosis in mesentery, although the glands in mesentery were greatly enlarged. No calculus was found in pancreatic duct.

Remarks—The very short duration of the case is noteworthy. The symptoms more or less pointed to intestinal obstruction, but the physical signs were not definite enough to justify any operative measures. Previous history obtained from friends showed that deceased had previously complained of often having severe pains in the episgastric region, with shortness of breath and a general feeling of discomfort, the duration of each attack varying from a few hours to a day. Deceased never consulted any medical men for the same, but had himself bled every six months, which is a common practice amongst the Goanese.

The extreme fibrosis of the pancreas would lead one to infer that the patient had suffered from attacks of pancreatitis for some time and that he had at the end an acute attack, which from the considerable hæmorrhage found, brought about his very sudden death.

For reference the case published in the *Lancet* of September 26th, 1903, page 889, under the heading of "A Case of Strangulated Hernia associated with Acute Hæmorrhagic Pancreatitis" and also the pathological connections as reported by Walker G. Spencer, M.S., M.B., F.R.C.S., in his contribution to the Medical Annual of 1903, page 503, "On Surgery of the Pancreas" will be of further interest.

BRIEF NOTES ON SURGICAL CASES IN THE MEDICAL COLLEGE HOSPITAL, CALCUTTA.

By CAPTAIN E. O. THURSTON, F.R.C.S., I.M.S.,

Resident Surgeon, Medical College Hospital, Calcutta.

Lipona of Tongue.— S. P., male, aged 55, Madrasi. Twelve years before admission he felt pain in the right side of his tongue towards the base and discovered a small tumour which has been gradually increasing in size. The pain also increased and lately has become paroxysmal and referred to the distribution of the branches of the 5th nerve. Salivation was also much increased.

On admission there was a rounded tumour the size of a walnut in the right posterior half of the tongue, with a small nodular projection on the surface, semi-elastic; the mucous membrane was stretched over the tumour but was not adherent. Finer movements of the tongue were interfered with, causing blurring of the speech. A needle was put into the tumour but no fluid removed, an incision was then made along the border of the tongue, the muscles separated and the tumour easily shelled out. There was no hæmorrhage at the time but a few minutes later copious bleeding occurred, not stopped by pressure; sutures around the cavity combined with gauze plugging soon stopped it. There was a severe secondary hæmorrhage on the 3rd day; which was arrested by gauze strips soaked in adrenalin solution and a slighter hæmorrhage on the 4th day. Further progress was satisfactory.

On section the tumour was encapsuled, of a whitish yellow colour with fibrous bands and fairly firm, in fact it had very much the same naked eye appearance as a febro-adenoma of the breast; under the microscope it was only composed of fat cells. The rarity of simple tumour of the tongue renders this case worth recording. (Wards of Lt.-Col. R. D. Murray, M.D., I.M.S.)

Fracture of pelvis; tramuatic hernia into the perineum.—M. J., male, aged 7. Was sitting on a sack of grain in a cart when the sack fell to the ground and he with it, striking his pubes and perineum against the wheel of the cart during his fall.

On admission superficial laceration of the perineum and small lacerated wound of the left side of the scrotum; large hæmatoma over the spine of the left pubes extending upwards

and outwards and another hæmatoma in the perineum mainly on the left side. Separation of the symphysis pubis. No hæmorrhage from the urethra, a soft catheter passed easily.

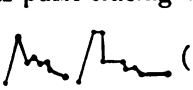
Two long outside splints were applied and the wounds dressed. The bladder had to be relieved for the next few days. The hæmatomata gradually subsided. Splints removed on the 18th day; there was a slight gap between the pubes and slight movement between the two bones was obtained without causing any pain to the patient; extending upwards from the junction of the inner and middle third of Poupart's legament was a triangular rent in the abdominal muscles, apex upwards, which had been previously obscured by the extravasation of blood; on placing the finger on this tear a slight impulse on coughing was detected. In the perineum, slightly to the left of the middle line was a soft doughy swelling about the size of a half walnut, partially reducible and with an impulse on coughing. Pressure through the rent in the abdominal wall caused this swelling to become more prominent and *vice versâ* though to a much more limited extent; a vague sense of fluctuation could also be felt between a finger placed on the perineal swelling and the rent in the abdominal wall. The hernia in the perineum became spontaneously reduced on the 25th day and did not re-appear before discharge on the 34th day. After reduction a small aperature could be detected, which later filled up and also to a less extent the tear in the abdominal wall. The separation of the symphysis became firmly united and the boy walked perfectly well. It is remarkable that with the laceration of the pelvic fascia which occurred to permit of the descent of the hernia that the urethra escaped injury. (Wards of Lt.-Col. R. D. Murray, M.D., I.M.S.)

Gallstones.—E. G., female, æt. 38, European, has had several attacks of biliary colic, the first 8 years, followed by others respectively 5 years, 2½ years (with jaundice), 2 years (3 attacks at short intervals), 7 months and 3 months before admission; during the last attack she had severe hepatic pain and noticed a swelling below the costal margin. Three of these attacks were during the later months of pregnancy. Her teeth were bad and she has always been constipated.

On admission the gall bladder was slightly distended and could be easily felt; some tenderness was present.

Operation.—A round firm pillow was placed beneath the back, incision through the right semilunar line; the gall bladder reached to about an inch below the margin of the liver; no adhesions or thickening of its wall; its peritoneum was sutured to the peritoneum and deeper layers of the abdominal wall; the fundus of the gall bladder was incised and about 60 small cholesterine gall stones were removed. The incision in the gall bladder was sutured to the abdominal wound and a drainage tube inserted, a probe passed easily into the common duct. The escaping bile was syphoned off into a bottle, the amount in 24 hours varying from 11 ozs. to 1½ oz. Further progress was satisfactory; the fistula closing on the 18th day. (Wards of Lt.-Col. Charles, M.D., I.M.S.)

Sarcoma of Neck, removal with portions of the common carotid, internal jugular and vagus.—K. C. M., *æt.* 47, male Hindu patient, had noticed a swelling in his neck 2½ months before admission, which has rapidly increased in size. He suffered pain when moving the head and later from occipital head-ache. On admission there was a hard tumour the size of a small orange about the centre of the left sternomastoid, hard and involving the muscle; it could be moved slightly on the deeper parts, skin not involved, some tenderness on pressure. Pulse 75 per minute, incision from level of mastoid to just above clavicle. The growth involved the sternomastoid and also the great vessels and vagus, the muscle was incised over the growth for further examination and then divided just above the clavicle; the carotid sheath being exposed, the common carotid was ligatured below opposite the 6th cervical vertebra and the internal carotid above just below the carotid canal and the trunks divided near the ligatures; the internal jugular was similarly treated. The vagus also was cut above its connection with the superior cervical ganglion of sympathetic as it could not be directed out of the growth, which was then removed.

There was severe shock but the patient rallied after the exhibition of strychnine hypodermically and saline and brandy *per rectum*, the saline and brandy injections were twice repeated in the course of the day. The pulse and respiration rates in the first four hours after operation varied from 92-118 and 22-30 respectively, the more rapid rate of respiration being directly after the operation, the respiration rate again rose to 30 in the evening, 2nd day pulse 122-126, respiration 22-24, 3rd day pulse 100-112, respiration 20-22, 4th day pulse 120-124, respiration 20-23, 5th day pulse 134-140, respiration 22, 6th day pulse 134-140, respiration 22, 7th day pulse 134-140, respiration 28, from this date the pulse and respiration rates on the whole gradually diminished. The patient was the subject of chronic bronchitis and this was increased after the operation with profuse mucopurulent expectoration, the physical signs in the chest were limited to a few rhonchi. There was slight suppuration along the back of the drainage tube. He was discharged on the 32nd day; at that time the pulse rate was 116 and the respirations 20. A pulse tracing showed nothing abnormal save  (Wards of Lt.-Col. Charles, M.D., I.M.S.)

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ANKYLOSTOMA INFECTION.

THE valuable papers which we publish in this issue direct attention to a subject which has very frequenty occupied the minds of writers in the *Indian Medical Gazette* for the past 15 years. It is not necessary to go over the history of the question since attention was first prominently attracted to it in India by the publication of the views of Giles, Dobson, Dodds-Price and many other medical men in Assam during the first investigations into that still mysterious disease, known as *Kala-azar*, which would seem in the near future to be forced to yield its secret and turn out to be a form of febrile and splenic cachexia due to infection by the Leishman-Donovan bodies. One result of the theory that ankylostoma infection was a factor in *Kala-azar* was that special attention was devoted to its presence, and the results of much investigation, especially by E. Dobson, showed that ankylostoma infection was a fate that few natives of Bengal or Assam or indeed of India escaped, as Dobson was able to show that about 80 per cent. of the coolies who passed into Assam for labour on the tea-gardens were infected, and further research during the past dozen years has only tended to show the accuracy of his observations, and to him has been generally given the credit of establishing the widespread prevalence of this intestinal parasite. The figures given in Captain Lane's article show that in many parts of India a wide degree of prevalence has been ascertained. In the Saran district of Bihar, and at Puri in Orissa, Lane shows that over 70 per cent. of new admissions to prison harbour the worm. Calvert at Cuttack and Durbhunga has recorded even a higher percentage, and at the latter place his figures have been confirmed by Grainger and Gwyther. In Dacca Campbell has shown that 12 per cent. were infected, and a much larger percentage among the prisoners of the Penal Settlement in the Andamans. At Rajamundry, in Madras, Fearnside has recorded that 68 to 74 per cent. of those examined were infected, so that it cannot be denied that the parasite is one of the greatest importance and one which cannot be lost sight of in diagnosing or treating the various forms of anæmia which so often are found in tropical practice.

To what extent ankylostoma infection is found in other parts of the world is not very thoroughly known. It certainly exists as an endemic infection in most warm countries, and in a most valuable article in the *Journal of Hygiene* (Vol. IV, p. 73) Drs. Boycott and Haldane state that it (ankylostomiasis) "prevails to a serious extent within about 35° north or south of the equator." Many European countries have been and are infected, *e.g.*, Italy, Hungary, Germany, and it seems probable that it may exist in the Peninsula. In England its presence has only recently been demonstrated, though how the symptoms of the miners in the Dolcoath mine in Cornwall can have been misinterpreted for so many years is not easy to understand, considering how well known was the historic case of this infection of the workmen at the St. Gothard tunnel more than 20 years ago. Its considerable prevalence, too, in the Southern States from Texas to N. Carolina is not a new fact, but only a new discovery. The same observer, Stiles, who discovered the worm in the United States* has also found it in Porto Rico and Cuba, and its existence in the British West Indies, and in Brazil has long been known. In Egypt, as all know, much good work on this infection has been done for years past.

Cases have also been recorded in the Philippines, and even in Queensland and at Kimberley, so that it is probable that miners in every country are liable to this infection.

In the article already quoted Boycott and Haldane give a valuable account of the life-history of the ankylostoma worm,† to which we refer all our readers who are interested in the subject. We can only touch upon a few points here. It is certain that the adult worm may live in the human bowel for several years, and this fact has a most important bearing upon the

* The American form of this Hook-worm differs from that known in Europe, Egypt and India. The American form has only one median tooth instead of the two dorsal teeth and four ventral hooks of the better known variety. The ova in American form measure about 64 to 76 μ by 36 to 40 μ instead of a mean of 59 by 37μ in the old world species.

(Boycott and Haldane, *loc. cit.*, p. 74).

† We agree with these writers in rejecting the American name *Uncinaria*; the older name though cumbersome is now well known.

method of spread of the disease in places newly affected. The infective stage of the ankylostoma is the developed larval worm, "if fully developed encapsuled larvæ be swallowed ova begin to appear in the fæces in about a month." As regards the path of infection—till recently it was assumed that the sole source of infection was through the mouth, but in 1898 the experiments and observations of Looss in Egypt, confirmed by Bentley in Assam, showed that a man could become infected through the skin and in further confirmation of this method of infection Boycott and Haldane have described the curious skin affection, locally known as "bunches," to which the Cornish miners are very liable.

Another important point is worked out by the authors just quoted, *viz.*, that a certain degree of immunity is gradually established to the presence of the worms, a theory which is supported by the well-known difference of opinion as to the harmfulness or otherwise of the parasite, for it is a recognised fact in India that many a person harbours these worms in his jejunum without being appreciably the worse. So that it is certainly possible that in tropical countries a certain degree of hereditary immunity has become established in many individuals.

As regards treatment it is certain that thymol when used in large doses, say three successive doses of 30 grains at intervals of a few hours, is very frequently successful. This should be preceded and followed by a purgative, as calomel or podophyllin, which has recently been highly praised. Oils, such as castor oil, and alcohol in any form should not be prescribed with thymol. The Germans, from their experience in the Westphalia mines, trust to extract of male fern, and in big doses it is a successful, if nauseous. drug when *freshly* prepared. Dr. Bentley records in his present article his belief in beta-naphthol.

There remains the question of *prevention*. It is clear that it is very much easier to suggest methods of prevention in places like England or Germany, where the disease is localised in certain mines, than in India or Egypt where the disease is endemic. The principle of prevention is the same, *viz.*, to prevent the fæcal matter containing the ova from getting into the system of the healthy. The authors, from whom we have quoted above, recognise three chief ways, *viz.*, by means of turbid or dirty drinking water, by ingestion of the larvæ from dirty food or dirty hands, and through the skin. It is obvious that in mines the only way to control the disease is to prevent the practice of indiscriminate defæcation which seems to be so common in them. The introduction, therefore, of any satisfactory system of latrines in any community will largely control the spread of the disease, and the more efficient the method of nightsoil disposal the better will the effects be, for it must never be forgotten that "if contamination of the ground by human fæces be prevented, there is no possibility of ankylostomiasis spreading," and it is to the better provision of such elementary items of municipal hygiene that we must look for the limitation of the infection in the villages and rural areas of India.

SPOTTED FEVER OF THE ROCKY MOUNTAINS.

UNDER the title of *Studies in Pyroplasmosis Hominis* there appears an interesting description of "Spotted" or "Tick Fever" of the Rocky Mountains, by Dr. L. B. Wilson and Dr. W. M. Chowning, published in the first number of *The Journal of Infectious Diseases*. If this journal maintains the excellent standard of this issue, it should prove a most valuable publication. The disease has been known clinically for nearly a score of years by physicians practising in the Bitter Root Valley, Montana, but its etiology has only recently been worked out by the writers. In Montana the disease seems to be confined to the west side of the Bitter Root Valley, in an area from four to ten miles wide and fifty miles long, at about 3,500 feet above sea-level.

The Bitter Root Range is very rugged, and snow-covered until the end of June; but the snow melts on the foothills even in February, and disappears entirely in April or May. The fever occurs between the middle of March and the middle of July, being most prevalent in the latter half of May and first part of June. It is commonest amongst males from twenty to forty years of age, and among females of a somewhat younger age, these persons being most exposed to the infection from their work or pleasure excursions taking them to the foothills in spring.

In all cases examined by them the observers found small wounds in the skin, alleged to have been made by the bites of ticks. These ticks

belong to the genus *Dermacentor;* they appear in spring as soon as the snow melts, become active towards the end of March, are most numerous in May and June, and they disappear about the middle of July. Thus, there is a striking parallel between the synchronous incidence of the fever and the prevalence of these ticks. Just as the parasite of malaria is conveyed by the *Anopheles* mosquito, and the *Pyroplasma bigeminum* of Texas fever in cattle is conveyed by ticks of the genus *Boöphilus*, so it is surmised that the *Pyroplasma hominis* infects man through the agency of ticks belonging to the genus *Dermacentor*. The writers mention the possibility of a rodent, the *Spermophilus columbianus* being a link in the chain of infection. These spermophiles harbour a great number of ticks in spring, and twenty per cent. of the spermophiles examined in the infected area had hæmocytozoa in their blood, which it was found impossible to distinguish morphologically from those in the red blood corpuscles of patients suffering from spotted fever.

Two types of the disease are said to exist, mild and severe. The former is often difficult to diagnose, and there is no skin eruption. In the severe, and usually fatal form, the diagnostic feature is the "spots." In the beginning there is soreness about the tick bite, with pains radiating from it until the onset of the initial chill.

The chill is most severe at the onset, being accompanied by severe aching in the bones and muscles, and pain in the back and joints. The chills recur at irregular intervals, gradually getting less. The other symptoms are prostration, severe headache, constipation, dry skin, coated tongue, restlessness, bronchial cough, diminished quantity of urine, which is high-coloured and occasionally contains albumen. Later the sufferer has the appearance of a typhoid-fever patient. On the second day the temperature may reach 103·° or 104·°F., steadily increasing to a maximum of 105·° to 107·°F from the fifth to the seventh day. There is usually an evening increase and a morning decrease. In fatal cases the temperature may be normal or sub-normal for a day before death. Recovery is usually by lysis, resembling typhoid fever.

The skin eruption commences from the second to the fifth day after the initial rigor, appearing first about the wrists, ankles or back. It extends over the entire body, the abdomen being usually last involved. At first the macules are rose-coloured, circular spots, disappearing on pressure; later on they become permanent, and of a dark blue or purple colour. The result is a mottled or marbled appearance of the skin. Usually there is some jaundice. The skin becomes glazed during the second week, and desquamation occurs during the third week; but the spots, though fading as the fever subsides, do not vanish entirely for weeks or months.

The blood shows a marked reduction of red blood cells and of hæmoglobin, with an occasional increase of leucocytes. Widal's reaction does not occur. The spleen is uniformly enlarged and tender. Anorexia, nausea and vomiting commence in the second week, constipation exists throughout the attack. The mortality amongst severe cases with the characteristic eruption amounts to from 70 to 80 per cent. Death commonly occurs between the sixth and eleventh days. A less severe form of the disease has been observed in Idaho, Nevada and Wyoming, where the prognosis is usually much more favourable. The hæmatozoa frequently require some searching for, and they vary in size, form and staining reaction at different stages. In the smallest form they are somewhat hyaline, ovoid, paired bodies, free or within the red cells, 1μ in thickness and 1 to 2μ in length. In the next phase the organism is usually solitary within the red cells, ovoid or spheroidal. It is from 2 to 3μ thick, from 3 to 5μ long, and shows active amœboid movements. The writers have named this hæmocytozoan the *Pyroplasma hominis*. They have succeeded with inoculation experiments in rabbits. The results of treatment have been disappointing, quinine is the only drug which seems to have been of any use, and the benefit conferred by it is open to doubt.

THE BENGAL BRANCH OF THE COUNTESS OF DUFFERIN'S FUND.

The eighteenth annual report of this branch of the *National Association for Supplying Female Medical Aid to the Women of India* has recently been published. It deals with the work performed during 1903. Owing to death, retirement and transfer there have been several changes amongst the Executive Committee, including the President, Lady President, Honorary Secretary and Honorary Treasurer, as well as several of the Committee. To ensure continuity it has been arranged that the Private Secretary to the Lieutenant-Governor shall always act as Hono-

rary Secretary to the Bengal Branch. In consequence of the suggestive memorandum by Mr. Carstairs, I. C. S., criticising the working of Dufferin Hospitals, the opinions of all the Civil Surgeons and other medical authorities in Bengal have been collected. There seems to be a consensus of opinion that the chief cause of inefficiency lies in the defective education of the female staff employed in these institutions. A special sub-committee appointed to consider the matter has recommended:—

(1) "that Government should be asked to assist in raising the standard of female medical education in the Medical Schools;

(2) that the Committee should carefully revise its policy of aiding hospitals by grants of money;

(3) that all candidates for employment as Lady Doctors, under the auspices of the Fund, should be required to produce evidence of having undergone practical training in a Special Women's Hospital, for a period of at least one year after passing their qualifying examinations;

(4) that the Central Committee should be asked to appoint a highly qualified Lady Doctor as Inspecting Medical Officer of all genuine *purdah* hospitals working in India under the name of Dufferin Hospitals."

All these suggestions are eminently reasonable and practical, and, if carried out in the spirit they are intended to be, they should produce a great improvement in all the hospitals connected with this most beneficent scheme.

It is a matter for regret that the financial state of the Bengal Branch of this Fund is not so prosperous as it deservedly ought to be. This is largely owing to the embarrassed condition of an estate from which the Fund draws a portion of its income, and partly also to a falling off in subscriptions from the public. But it is encouraging to learn that there has been a decided increase in the receipts from nursing fees and paying patients.

There were 43 hospitals and dispensaries in Bengal officered by women; of which the Victoria Hospital and *Annexe* in Calcutta were maintained entirely by the Bengal Committee, four institutions were managed by the Dufferin Fund and supported by local funds independent of the Bengal Branch, eight were aided by the Fund, and the remaining thirty were maintained from other sources not connected with the Fund. The total number of patients treated during the year was 186,645, of whom 113,035 were women and 73,610 were children. The in-door patients numbered 6,602, with a daily average of 288·39 women and 46,887 children, for whom 478 beds were available. There were 180,043 out-door patients, of whom 113,035 were women and 73,610 children, giving a daily average attendance of 1,376 and a fraction.

In addition to the imperfect professional training and defective general education of the female medical staff there are other factors militating against the success of many of the wards or hospitals for women, and more particularly in the case of strictly *purdahnashins*. We allude to the unsuitable selection of a site, inadequate arrangements to secure privacy, and lack of forethought or judgment as regards the details of cook-houses, store-rooms, arrangements for the accommodation of the friends of patients and for members of the hospital staff and establishment, not forgetting bathing and latrine arrangements. The circumstances frequently influencing the acquisition of a site have nothing to do with securing seclusion; the site may be a gift, it may be cheap, or it may be conveniently near other medical buildings. Much may yet be accomplished to obtain greater privacy in existing institutions, and greater care should be exercised in the site, plan and construction of new hospitals.

LONDON LETTER.

INDIAN MEDICAL AND SANITARY REPORTS.

THE shortening of Indian reports constitutes a welcome and sound feature of Lord Curzon's administration. The compilation of these bulky documents involved an immense amount of infructuous labour and the perusal of them a serious waste of time and trial of temper. From every secretariat and department they issued in increasing number and weight. Their cost in preparation, paper, printing, binding and postage was quite incommensurate with their value, if not in inverse proportion thereto. The whole system was bad. The material which constituted the subject-matter was in most cases rotten, fictitious and made to order, and the expenditure of talent on compilation and elaboration was mischievous. The conclusions were specious and the composition attractive; but it was a case of a whited sepulchre, fair to view but foul within. Administration by means of these symbols could not be otherwise than unreal. I write feelingly on this subject,

because for many years it was my business to write and read these reports, and I retain a vivid recollection of the bewilderment and agony endured in dealing with them. Year by year they became more numerous and ponderous. The extent to which arithmetic entered into their composition was simply appalling. The manipulation of the figures was admirable. The tables and calculations were unexceptionable, and the only fault was the absence of accuracy and truth in the items on which they were founded. It is still my business to read and review Indian Medical and Sanitary Reports, and the comfort which their abbreviation has caused is a source of thankfulness. There is still too much arithmetic in most of them. It is so easy to sit in one's office and prepare tabular statements and to condense and comment on them, and so irksome to go out into the heat and glare and obtain information by personal observation and inspect work doing and done. Yet it is precisely in proportion to the extent to which these two elements enter into the construction of a report that it possesses the attributes of utility and value. If figured statements were eliminated from the great majority of Indian Medical and Sanitary Reports there would be very little left of them. Apart from tabular appendices every page bristles with figures, and in some it is difficult to find a line devoid of them; and much of the letterpress consists of speculation as to the accuracy of the numbers. In this respect there is still abundant room for reformation, and there need be no lack of material for profitable record and discussion connected with practical administration, whether as regards measures for medical relief or sanitation.

THE ROYAL ARMY MEDICAL COLLEGE.

The competitions for the R. A. M. C. and I. M. S. took place in January and resulted in the selection of 30 out of 58 candidates for the former, and 20 out of 42 applicants for the latter. These gentlemen are now undergoing a course of instruction in the R. A. M. College in London. The Session was opened by an interesting introductory address by the Director-General, Surgeon-General Sir William Taylor, in which he pointed out the great advantages which both services had for so many years enjoyed in attending the special instruction supplied by the Army Medical School at Netley. The London College is a continuation and development of the Netley School. All the time-honoured methods have been retained and reformed for the training of young officers entering the service, and methodical arrangements made in addition for the benefit of senior officers returning to refresh their knowledge generally or study some speciality. The hospital at Milbank, which is to provide means of clinical instruction, is approaching completion, and an assignment has been made for the College buildings, the plans of which have been prepared and sanctioned. These have been reproduced in the Journal of the Royal Army Medical Corps and appear to provide ample and appropriate accommodation. The arrangements include a house for the Commandant, and quarters for officers attending the various courses.

A UNIVERSAL LANGUAGE OF SCIENCE.

The effect of the curse of Babel is acutely felt at meetings of the International Medical Congress. Papers are read and speeches made in various tongues, and, perhaps more disconcerting, is the attempt made by many members to speak the language of the country in which the meeting is held. The use of a speech known to and understood by all would obviously be a great advantage. This consideration has inspired the *British Medical Journal* to advocate the employment of a universal language of science. Such a language would necessarily be either a newly invented tongue, or a dead language or a living one. Attempts have been made to invent a universal language; but these have not been a success. It would simply be to add another element to the confusion of Babel to introduce a new and strange form of speech, and in this busy rushing century, it is more than doubtful whether people would find inclination or time to acquire sufficient familiarity with it for purposes of written or spoken communication.

Among dead languages Greek and Latin are the only forms claiming serious notice. Scientific terminology, derived from both, constitute a nucleus of a universal medium of inter-communication which, in fact, at one time Latin was. In these days, however, a knowledge of living languages is found to be more useful than of dead, and the hope inducing men of science to become accomplished Latinists seems a vain one. Aspirants to scientific success require all their time for acquiring scientific habits, methods, and knowledge, and these must be gained early in

life or not at all. The question therefore narrows itself to this: what living tongue is most entitled to become the universal language of science? The choice lies between English, French and German—the language of the majority of educated and scientific men is that which possesses the strongest title to adoption. Personally I have no hesitation in claiming for English the palm; but I doubt very much whether scientific progress is really impeded very materially by language difficulties. Important observations and discoveries are very quickly made known by means of translation, and probably a great deal of material of doubtful value is best concealed in some vernacular until it has been tested and verified and found to be spurious or genuine.

THE X-RAYS IN COURT.

A curious case has recently been tried in Ireland. An infant of Galway sued through its father the President and Professors of Queen's College, Galway, William Haire, Mechanical Assistant to the Professor of Natural Philosophy in the College, and Dr. Colohan, a medical practitioner, and sought to recover damages for personal injuries caused by the alleged negligence of defendants in the use of certain electrical apparatus. It appears that the infant got a needle into its knee, and Dr. Colohan employed Haire to take a skiagram. The exposure to the X-rays caused a burn, and it was contended that the operation was done unskilfully, the exposure being too long and the vacuum tube being held too close to the skin. A great deal of expert evidence was heard, for and against, and finally the jury found for the defendants acquitting them of negligence and declaring that both doctor and photographer did their best for the patient. The verdict has given general satisfaction.

K. McL.

The 18th February, 1904.

Current Topics.

RE-VACCINATION.

RE-VACCINATION was made compulsory in Germany after the Franco-Prussian War. France has only quite recently followed Germany's example in this matter. In Great Britain the Imperial Vaccination League is promoting a Re-vaccination Bill, which is down for the second reading in the House of Commons on the 26th April. The passing of such a measure could prove an incalculable benefit; but such a result is very improbable in this Parliament, with such a record of vaccination legislation as the present Government possess.

THE THOMPSON YATES AND JOHNSTON LABORATORIES REPORT.

VOLUME V of the new series contains memorial notices of the late Rev. S. A. Thompson Yates, M.A., and of the late Prof. Nocard; the former was the founder and generous supporter of these laboratries.

The other contents are as follows:—*The first Report of the Trypanosomiasis Expedition to Senegambia*, of which a synopsis was given in the *I. M. G.* for January. *A new Parasite of Man*, by Major Ronald Ross, I.M.S. (*retd.*), in which he discusses the bodies found by Major Leishman, R.A.M.C., and Captain Donovan, I.M.S. He disagrees with the view that they are either trypanosomes or malaria parasites, and thinks there is more in favour of Laveran's view that they belong to the genus *Piroplasma*. At the same time Major Ross suggests that they belong to a new genus of sporozoa, and proposes to call the genus of *Leishmania donovani*, Laveran. There is a brief note on the *Discovery of Trypanosoma Gambiense, Dutton*, by Prof. R. Ross and Prof. R. W. Boyce, in which they uphold Dutton's claims as the discoverer of this trypanosome, in preference to Forde who thought the organism was *Filaria perstans*.

Dr. E. Glynn and Dr. J. C. Matthews have contributed a very interesting article on *Bacteria in Public Swimming Baths*, in which they record their observations made in the Liverpool Public Baths. They examined both fresh and salt water baths for the number of bacteria present at the beginning and end of the day; the source of the bacteria; the presence of certain pathogenic bacteria and the possibility of contracting infectious or other diseases from bathing. They give some surprising calculations, *e.g.*, they state that the water removed from the skin and hair of each bather in a first class salt water bath, which was emptied daily, in about ten minutes amounts approximately to 4,000,000,000 bacteria, while in a second class bath they estimate 6,000,000,000 bacteria per bather. The skin of the small boy bathing in a second class bath they calculate to be at least twice as dirty as that of respectable adult bathers in a first class bath. The bacteria found in fresh water baths greatly outnumbered those in salt water. They make a very good practical suggestion to the effect that public baths should have two corridors, one for entrance and exit to and from the dressing rooms, and another corridor round the bath for the bathers when stripped. Baths with a single corridor round the bath are liable to contamination from dirt carried in on the boots of people entering. Another way of obviating this

is to make all people leave their boots in an outer room and enter in slippers provided at the baths.

The last article in the volume is a rather inconclusive one on a Parasitic Disease in the Haddock by Dr. J. W. W. Stephens and Dr. R. Boyce.

PRACTICAL MEDICINE.

This is the title of a medical journal published at Delhi, which has entered on its second year, and appears to be thriving. The editor is Assistant-Surgeon Ram Narain, L.M.S. (retired). The annual subscription is only Rs. 3.

HAND INFECTION.

In the Manila Biological Laboratory Reports, Drs. McDill and Wherry report a very complete study of two cases of a peculiar form of hand infection due to an organism resembling the Koch-Weeks bacillus. The patients were a surgeon and a nurse, the latter being infected from the former, and the surgeon is supposed to have derived his infection from the purulent discharge of a case of acute contagious conjunctivitis. The special points about this form of hand infection are the slowness of the infective process, lasting about a month, the severity ending in gangrene of half the finger in the nurse's case, the absence of pus formation, the great redness and swelling of the initial stages. The severity of the pain and physical prostration were excessive. All the usual surgical measures appropriate to cases of hand infection proved futile, so that the infective inflammation ran its own course. During the acute stage the bacilli were present in large numbers and apparently in pure culture, and they gradually disappeared as the acute symptoms passed of. They stained well with carbolthionin or carbol fuchsin 1 in 10, not so with Gram's method. Cultures were obtained, with same difficulty in the first instance, and inoculations from the cultures proved inconclusive. The observers consider the organism to have been the Koch-Weeks bacillus.

RADIUM IN CANCER OF THE THROAT.

Dr. David Walsh, of the Western Skin Hospital, London, in the *Medical Press and Circular* reports the beneficial action of radium as applied to the tonsil, fauces, pharynx and soft palate in a cancerous condition. It is necessary to bring the radium into as close contact as possible with the malignant tissues. After cocainising the throat, inserting a gag, and throwing the light of a forehead mirror into the mouth, he applied scaled glass tubes, each containing five milligrammes of radium bromide. The tubes were enclosed in a thin layer of india-rubber and kept in position by a curved holder. The intolerance of the throat to contact was gradually overcome until the sittings extended from fifteen to forty minutes. It is reported that malignant stricture of the œsophagus has been treated abroad by bougies armed with a bulb containing radium. Nodules in the skin have been treated by radium enclosed in a small india-rubber capsule with a mica window. The capsule is fixed in position by a adhesive plaster and kept there from fifteen to twenty-five minutes. A dermatitis ensues in from two hours to two days, followed by shrinking and disappearance of the nodules.

OPERATIONS ON THE CAPSULE OF THE KIDNEY.

Dr. E. Reynolds of Boston prefers slashing the capsule in parallel lines to decapsulation, and he operates on one kidney alone. By ureteral catheterisation he endeavours to ascertain which is the diseased kidney, or which is the worse of the two, and this he selects for operation. He avoids cases with general uræmic symptoms, selecting those in which constitutional depression predominates. Dr. A. T. Cabot considers the beneficial effect in these operations accrues from (1) the counter-irritation and local blood-letting of the operation; (2) the manipulation of the organ getting rid of casts and débris; (3) improved blood supply in the process of healing; (4) the relief of tension caused by incising, splitting or removing the capsule. He prefers operation in the early stages of renal disease.—*Boston Medical and Surgical Journal.*

INDIAN MEDICAL GAZETTE.

Major W. J. Buchanan, M.D., I.M.S., has returned to India and resumed the editorship of the *I. M. G.* from the end of March.

GOAT'S LIVER FOR NIGHT-BLINDNESS.

A correspondent has forwarded the subjoined note on this subject:—

The *Strand Magazine* for January 1904 contains an article entitled "Prince Henry's Beast Book," giving an account of a work named "Four-footed Beastes" published in London, in 1607, by Edward Topsell. The article contains a number of illustrations of fearsome animals, which apparently were supposed, in those days, to inhabit the earth; the *Lamia*, a scaly beast of prey with a woman's face and breasts; the *Harpy*, a bird with a woman's head; the *Sphinx*, a curious quadruped with a human head; the *Mantichora*, a lion with a man's head; the *Poephagus*, a quadruped, man in its head half and pig in its hinder quarters, and many other equally strange animals. Among the assertions which the author of the article picks out of Topsell's work as specially absurd is a statement that "if those that are blind in the night eat a goat's liver they are granted sight." But of late

years the treatment of night-blindness by the use of goat's liver as food has been advocated in the pages of the *Indian Medical Gazette*, and has been found successful. Truly has it been said that there is nothing new under the sun.

VILLA ASYLUMS.

QUITE half a dozen years ago we drew attention in the columns of the *Indian Medical Gazette* to the merits of the Alt-Scherbitz Asylum near Leipsic. The first institution of a similar kind, on the villa or segregation system, in Great Britain, has just been opened at Kingseat, near Aberdeen. At present it affords accommodation for 470 patients, but eventually this number will be raised to 700 inmates.

The merits of this system from the point of view of the rational and economical treatment of the insane we have described in various articles. But this asylum at Kingseat brings into prominence the feature of economy in construction. It amounts to about £250 for each of the 470 beds, including cost of site, buildings and furnishing. When the accommodation has been increased to 700 the cost will be reduced to £201 per bed. This compares very favourably with the cost of other recent asylums of the corridor and pavilion pattern. Including cost of site buildings and furnishing, the outlay per head has been at Gartloch, Glasgow, £466; at Hartwood, Lanarkshire, £348; and at Govan, £461. The new asylum at Bangour will cost the Edinburgh District Lunacy Board at least £400 per bed, and probably more. The villas at Kingseat hold from thirty to forty patients, and are scattered over a wide area. The food and linen from a central kitchen and a central laundry are conveyed to the villas on trolleys.

A QUESTION OF PRIORITY.

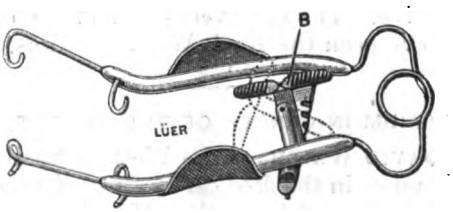
IN the important paper by Lieutenant S. R. Christophers, I.M.S., which is reviewed in our columns this month, attention is drawn to an article by Dr. J. H. Wright, of Boston, in which similar parasitic bodies are described as having been found in a specimen of "Delhi sore," and the point brought out by Dr. Christophers that the process of ulceration of the large intestine in the cases seen by him in Madras is essentially similar to that which occurs in cases of Delhi sore, raises the important question as to whether the parasites found by Wright and those described by Major Leishman are identical. Further study is necessary before this question can be cleared up, but should it be found that they are so, the priority of the discovery of the bodies will undoubtedly rest with Surgeon-Major D. D. Cunningham, I.M.S., who in 1885 discovered in a specimen of Delhi sore parasites which are identical with those recently described by Dr. Wright.

CONTINENTAL EYE CLINICS.

FRANCE, Paris, *December, 3rd—10th.*—Visited Dr. Landolt's eye-clinic; there are 3,000 new cases yearly in the polyklinik. Landolt is assisted by his eldest son and by a resident chef-de-clinique. A private house has been adapted to form a hospital, and the funds are found by Prof. Landolt, who is assisted by friends to some extent.

Landolt operates before he visits his wards or polyklinik, to avoid sepsis, and to ensure his being fresh and untired. He and his assistants wash their hands with a special soap sold in sterilised tubes; they then rinse them well in perchloride solution, dip them in alcohol, and at once put on sterilised linen gloves (with one stall for the thumb and another for the four fingers) which are kept on until the operation is commenced. The gauze dressing for each case is wrapped separately in a piece of paper, and sterilised therein in the autoclave; it is only removed from the paper wrapping when it is on the point of being applied; the same is done with the cotton wool of the dressing and with each single towel used. All instruments are boiled in solution of soda carbonate, though Landolt admits the cutting ones are damaged thereby; duplicates of instruments are kept available, so that none need be applied to the eye twice. Women's hair is confined in India-rubber bathing caps during operation. In each vessel used is put a little ether after operation; this is shaken round and then ignited, with a view to sterilisation. Before operation the face is well washed with soap and warm water, and the conjunctival sac is freely irrigated with sterilised solution of boric acid (Landolt does not believe in the possibility of sterilising effectually the conjunctiva).

Cataract.—I witnessed a number of extractions; Landolt prefers, if possible, to keep his cases in bed for three or four days before operation to get them used to their surroundings; the following are the steps of his operation:—(1)

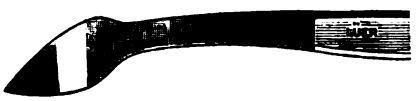


Landolt's Speculum.

insertion of Landolt's speculum (*vide* Fig.), the rotating arm B resting on the bridge of the nose, and apparently taking a good deal of pressure off the eye; (2) sclero-corneal incision; (3) free iridectomy (in all cases) with cross-action scissors, after removal of the speculum and fixation forceps; (4) capsule laceration with two cystitomes introduced in turn; these are sickle-shaped, and their cutting concave edges look respectively to the right and left; the

cuts made are both horizontal, but in opposite directions; Landolt believes that this double manœuvre ensures a free laceration of the capsule; (5) expression of the lens by gentle digital pressure applied through both eye-lids simultaneously; Landolt uses great care in this stage, as he greatly dreads the danger of vitreous escape; this accounts also for his early removal of the speculum, which he lifts (dropping the forceps to do so) at once if during the incision he sees that undue pressure is being exerted; Landolt's efforts are directed towards quieting his patient and increasing his confidence during operation, and to these ends all his movements are gentle, and devoid of hurry; he is the apostle of a minimum possible interference with the eye consistent with as complete a removal of the cataract as seems possible in each individual case; (6) the eye is closed with a light gauze dressing, and the two orbital cups are carefully filled in with cotton wool; a Fuchs' shield is applied over the operated eye, and a figure of 8-bandage keeps this in place, and closes the fellow eye; this bandage is sewn up behind and is not interfered with for 48 hours, when the first dressing is made.

Secondary Cataract.—Landolt employs a double-edged knife needle, which he is most careful to sweep round in the plane of the capsule, *and not to dip deeper in the vitreous than he can help.*



Landolt's Keratome.

Glaucoma.—Landolt's standard operation is iridectomy. He recognises the class of cases in which only the three signs (cupping of disc, retraction of field, and diminution of V. A.) are present, and thinks that at some period of the case a perceptible rise of tension may have been present; he does not dogmatise on this point. The keratome Landolt uses for iridectomy, is worth noticing. It is *bent* on the flat instead of being angled, and its edges are rounded. The advantages of both modifications are obvious. (*Vide* diagram.)

Lachrymal Obstruction and Dacruocystitis.—In mild cases he introduces fine olive-headed probes, and injects mild antiseptic solutions; more severe cases have the upper canaliculus slit, larger probes are used, and the injections are continued. In still more intractable cases he slits both canaliculi, joins the two incisions with scissors, and so enters the sac from above; through this opening he introduces a bead of silver nitrate, and cauterises the sac wall therewith; injections are subsequently continued. Extirpation of the sac has given him valuable results in extreme cases, but he finds his patients averse to so radical a procedure. He never uses large probes; the largest in his case was not (I think?) larger than a 6-Bowman, if so large.

Chalazion.—Landolt incises the sac, and then cuts out a free piece of its conjunctival wall with scissors.

A very interesting case in the polyklinik, was that of a young man, who some years ago contracted scarlet fever; during convalescence the present affection came on; he has absolute paralysis of the Recti, Obliqui, and Levatores, and he substitutes neck and shoulder movements for those of the muscles acting on the eye; his present complaint is that the ptosis, by damaging his appearance, lessens his wage-earning power as a chiropodist. Landolt is therefore going to operate for the ptosis by the following method, which I do not remember having met with in text-books, but which he has long used:—

(1) An incision is made 4 mm. above the edge of the lid, parallel to the same and as long as the lid is broad.

(2) Through this incision the lid is slit into two layers (the outer one being cutaneous) up to the level of the orbital margin (*vide* Diagram I).

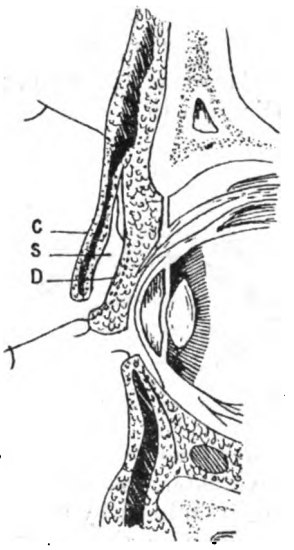
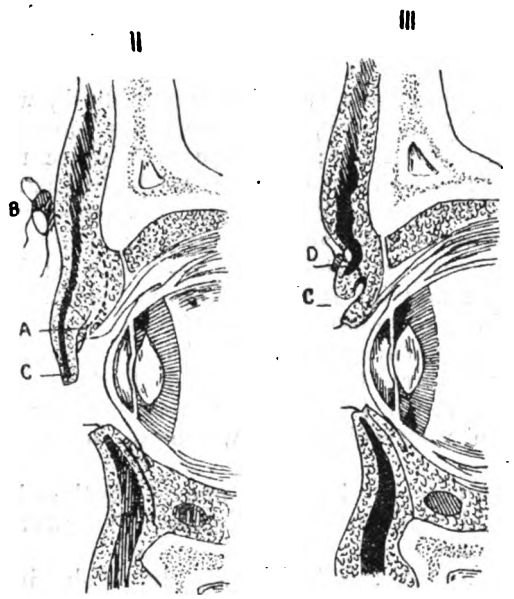


Diagram I.

Showing one end of a suture in position.
c=cutaneous lamina of lid.
d=deep lamina of lid.
d=space separating the above two layers.

(3) Three fine threads each armed with two needles are inserted; the two ends of each thread enter and emerge at about 6 mm. from each other, each needle entering at the skin margin of the lower flap, taking up a good mass of the tissue overlying the tarsus, and emerging through the skin above the eyebrow, after traversing the space between the two layers of the flap (*vide* Diagram II). The two ends of each thread will therefore emerge 6 mm. apart, and on the same horizontal level. They are now tied in a bow over a small pad of cotton-wool, so that, at a later

stage, they can be loosened or tightened according as we desire to diminish or increase the effect of our operation. The distance between the adjacent

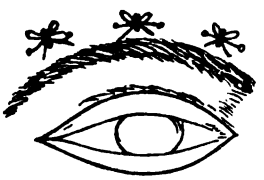


A B. Showing track of one end of one of the sutures which raise the lid.
C. Overhanging cutaneous layer at the close of the first operation.

C. D. Suture folding the cutaneous layer on itself after the second operation.

points of emergence of the different threads is similar to that between the two ends of each thread (*vide* Diagram IV).

IV



Showing the three threads tied each on itself at the close of the first operation.

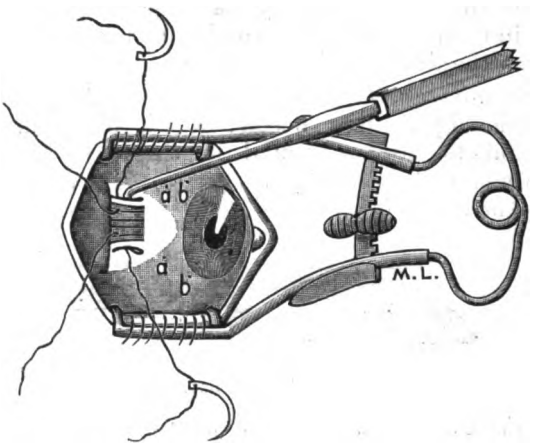
LANDOLT'S OPERATION FOR PTOSIS.

(4) Some days later, the cutaneous flap is raised, by folding it on itself by means of a special row of sutures likewise tied over pledgets of cotton wool (*vide* Diagram III); before so doing, the effect of the previous operation is carefully observed; if it has been too great, the cicatrix, which attaches the deep layer of the lid to its new position, is loosened a little with a knife, and the skin layer is attached to it at a suitable level, its excess being folded on itself as above described; the raw surface of the skin flap must, of course, be refreshed beforehand. If, on the other hand, the effect has been insufficient, a portion of the overhanging skin layer is cut off, and the original layer of sutures is replaced by a new layer, including the skin, and aimed at increasing the elevation of the lid.

Landolt claims for this procedure (1) that it admits of ready graduation, and (2) that it *restores the natural folds of the lid*, and so markedly improves the æsthetic effect obtained.

Strabismus.—Landolt never performs a simple tenotomy, but always advances the weaker muscle, on the ground that the latter requires to be brought up to the standard of its stronger opponent. He operates as follows:— A flap of conjunctiva whose summit reaches the cornea, while its base lies over the insertion of the muscle, is raised and excised; special forceps,

with their points bent at an angle, are used to lift up the episcleral tissue, which is then button-holed by scissor points, to admit a flattened hook; the muscle is well raised on the hook, freed from its attachments to the episcleral tissue, and picked up by two sutures, one at each margin, as far back as desired; one suture is black and the other white; the muscle is raised by traction on the sutures, and is then cut *clean across* on

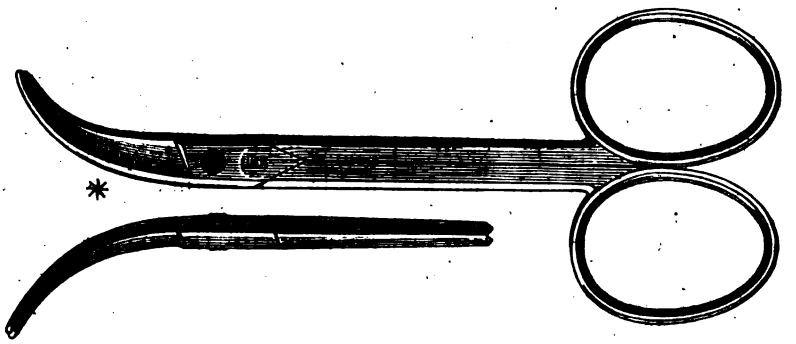


their distal side, the anterior cut end is now dissected up to its insertion and abscised. The needles on the two threads are next passed deeply into the episcleral tissue and conjunctiva (*vide ab, ab* in figure) close to the corneal margin; if one should be in doubt as to the grip secured, the suture must be passed twice through the tissue; each thread is now knotted once (a double bend being made to prevent slipping of the knot), and is pulled tight. When both sutures are thus in place, the final second knot is put on; an assistant draws the eye over to the affected side, whilst the surgeon is tying the knots, so as to avoid all strain. Landolt is not afraid of overdoing the correction, so long as the opposite muscle is not tenotomised, but he of course graduates the effect produced, according to the needs of each case. The conjunctival wound is well closed, and the insertion of the muscle is brought very far forward by this operation. I saw a number of patients on whom Landolt had performed it, and the range of excursion of the eye in every direction was wonderful, contrasting strongly with the results obtained after tenotomy, in

patients I was able to examine in other Paris cliniques.

Landolt talks excellent English, and most kindly devoted a great deal of his time on several occasions to demonstrating to me his methods for the examination of strabismus cases. He is essentially practical, and practises all he teaches. His views have been so clearly set forth in Norris and Oliver's System and elsewhere that it is needless to dwell on them here. One may be permitted, however, to draw the attention of Indian surgeons to his ophthalmotrope, as an aid both to teaching, and also to one's own study of eye-movements. It can be got from Messrs. Meyrowitz, 3, Rue Scribe, Paris. Landolt's synopsis of movements of the eye is probably well known. Curry and Paxton of Great Portland Street supply it.

Lastly, I would like to briefly mention Landolt's scissors for enucleation, which are curved *on two planes*, and are so carefully built, by Luer of Paris, that they veritably steal round the eye, and enable one to cut the tendons close to the eye-ball without the aid of a tenotomy hook and without any undue traction.



Landolt's enucleation-scissors curved on two axes. Price Rs. 6.

There is no surgeon in Europe whom I have had the pleasure of meeting who is more interesting or more kindly than Professor Landolt. An hour's talk with him will do a great deal to make most men feel how ignorant they are, and yet with it all, he is very simple and unassuming.

December 4th.—I visited La Maison de Santé of Drs. de Wecker and Masselon (55, Rue de Cherche-Midi), and met both these surgeons. They see their private patients from 1 to 4 P.M., whilst their four assistants are examining the patients in the free polyklinik. At 4 P.M. de Wecker takes his seat in the polyklinik, and each patient is brought in turn before him, with the results of examination and the diagnosis arrived at already marked on the outpatient paper. An assistant reads a short description of the case, if asked so to do, and de Wecker then orders the treatment. The last item seems to be merely a formula to satisfy the natural wish of the patient to be seen by the man whose name they know so well. There are 6,000 to 7,000 new outpatients yearly.

de Wecker is treating epithelioma of the lid with injections of quinine (twice weekly), and seems to think much of the method; he injects 1 cc. of a solution of 4 grammes of the hydrobromate in 14 grammes of water, at each sitting. I tried to ascertain whether a microscopical diagnosis of epithelioma had been made, but am still uncertain on this point.

Cataract.—de Wecker is a strong advocate of the simple operation, but he most emphatically assured me that he would not venture on it, if he was not sure of being able to keep his patients quiet in bed after operation; indeed, his two indications for the performance of an iridectomy are (1) any difficulty in immobilising the subject, and (2) immaturity of the cataract at the time of operation. The French peasant has a time-honoured prejudice in favour of having "his cataract plucked in the spring"; consequently many cases come in the warm months, and de Wecker has then to do iridectomy more often, "on account of the heat making the patients more restless at this time." When a patient with immature cataract will wait, de Wecker prefers to make a preliminary iridectomy rather than to do the combined operation at one sitting. This preliminary operation is done as soon as the sight falls below the necessary business-level.

de Wecker declaims strongly against any preparatory interference in cataract cases with the lachrymal passages, or with the conjunctival sac, provided that there is no obvious evidence of disease in those parts. He enquires if there is any lachrymation, presses over the sac with a finger, and inspects the parts; he makes a point of carefully inspecting the angles of the eyes for dried secretion, and in doubtful cases keeps the patient under observation and examines him for such evidence of morbid secretion on first waking; on test-irrigations of the lachrymal passages, on routine irrigation or brossage of the conjunctiva, and on test-bandages applied to ascertain the condition of that membrane, on all of these he pours out alike his ire and his ridicule.

* In ordering these scissors, it is well to ask for a light pair, similar to those used by Professor Landolt. Lüer is inclined to build them too heavy, and therefore clumsy.

He insists on the need for sterilisation of the eyelids, but will not allow soap to be used, as he considers it irritates the conjunctiva. I saw a case of cataract taken straight in from the out-patient room on to the table, without any preliminary face-washing; the lids were rubbed lightly with a solution of 1 per cent. oxycyanide of mercury on cotton pads, and nothing more was done in the way of preparation. Another case was likewise admitted for paracentesis, and operated on with her shawl over her head, just as she was except for the washing of the lids with antiseptic solution. de Wecker washed his hands carefully before the first operation, but not again, before any of the five that followed. He ridicules the practice of covering the rest of the face with a fold of sterilised cloth during operation, as he does also that of epilating or cutting the lashes; during operation he does not hesitate to give an instrument into the keeping of an assistant whilst he is using his hands for other purposes. The instruments are *all* sterilised by being heated in an autoclave up to 160° C., and then allowed to cool before removal. All drops are obtained every second day from a chemist, who supplies them carefully sterilised. Running through all his teaching on the subject of antisepsis one can read "*desinfection—sans toutefois tomber ici dans l' excés.*"

He strongly advocates the use of the narrowest knife-blade, consistent with the attainment of the requisite rigidity, in order to thereby ensure the edges of the incision being cut as nearly parallel as possible; his object is to obtain as large an aperture as he can for the exit of the lens, without unduly enlarging his incision. By placing the latter in the limbus he aims at making the edge of the cataract correspond with the inner lip of the incision, and thus facilitating the exit of the lens, cortical matter and all; he inveighs strongly against the "sin" of "over-restricted corneal incisions," especially when dealing with immature cataracts. He believes that cortical matter left in the eye leads to impaction of the iris in the wound and to prolapse of that membrane, owing to the swollen masses pushing the iris outward in front of them, and he therefore lays great stress on the desirability of thoroughly evacuating all lens débris. As soon as the section has been completed de Wecker removes the speculum, and discards forceps; he endeavours to remove a large portion of the anterior capsule with capsule-forceps, but admits that the method is more difficult than cystotomy, and that the special forceps used are very easily damaged and blunted. On the other hand, he claims for the method that it lessens the chance of secondary cataract. He inveighs against limited cystotomy, especially when made low down.

de Wecker delivers the cataract by the aid of a scoop applied below, while he makes counter-pressure above with his thumb through the lid; he then massages out any débris digitally through the two lids; he very rarely introduces any instrument into the anterior chamber to remove cortical masses, and he is most severe in his strictures on those who make this a routine procedure; the essence of his teaching on this subject is that with large incisions (up to half of the cornea) placed as above described, and with free laceration of the capsule, an opaque lens can be easily and safely delivered *with a minimum of interference on the part of the operator.*

Masselon's methods closely resemble the above, save that he uses no speculum, the upper lid being raised for him by an assistant; further he employs no instrument to effect delivery of the lens or of débris, but trusts entirely to digital manipulations applied through the two lids; these manœuvres are carried out with great dexterity, but one could not help noticing that the lid margins swept over the lips of the incision in a manner that menaced the asepticity of the latter, if the lids were not beyond all suspicion. It is of interest to notice that Masselon thus uses only two instruments, *viz.*, knife and fixation forceps. de Wecker closed the eye with a very light dressing kept in place by two strips of gauze soaked in flexible collodion, whilst Masselon went a step farther and omitted the dressing. He bade the patient close his eye, and then applied a single strip of gauze 2½ inchs long, and ½ inch broad, which he fixed *in situ* with collodion, above and below. On the fourth day de Wecker removes his dressing once for all, provided there has been no pain; he draws attention to the latter as the cardinal sign of some interference with the even course of healing; at the same time he watches carefully the angle of the eye for excessive secretion, and lays great stress on the ease with which this can be detected with the light dressing he uses. He has not a good word to say for bandages of any form, or for metal shields, and he is strongly opposed to closure of both eyes, as he thinks it leads to senile delirium; he scrupulously avoids moisture in his after-treatment, and if he desires to clean the eye at all, he does so with damp sterilised pads of wool. de Wecker is not ambidextrous and like many who are not, he is disposed to regard ambidexterity as "showing-off".

Even in summer, all operations are performed in darkened room, after the rest of the work is finished, an electric lamp being manipulated by an assistant. Cocaine is the anæsthetic used, and the solution is instilled twice, commencing three minutes before operation, and not sooner. de Wecker told me that his ideal procedure was to avoid both myotics and mydriatics at the operation, but he admitted that he usually instilled eserine before closing the eye. He admits to 6 to 8 per cent of prolapse, but says that he lets it alone, as he considers it a complication of little importance. This opinion is not, however, universally shared by his assistants, nor are his own writings consistent on this important point.

I saw de Wecker needle a cataract in a man whose hair was turning grey; he told me that he uses this method up to 30 or 40 years of age, and that he empties the chamber by means of a linear incision four days later. He employed a bladed needle bent on the flat for the discission.

He insists strongly on the need for following up cases of monocular zonular cataract, as he has found the second eye affected *very late* in child-life. He does not consider the danger past till after 12 to 14 years of age. This observation is so widely opposed to the existing views on the subject that I specially invite the attention of Indian surgeons to it, with a view to its control from their large experience.

Glaucoma.—de Wecker makes a preliminary anterior sclerotomy and follows it a few days later by an iridectomy, having freely exhibited eserine in the meanwhile. He uses a Graefe's knife. For buphthalmos he makes repeated sclerotomies.

Dacryocystitis.—He slits the canaliculus, and dilates with sounds; extirpation is but rarely resorted to.

All operations are performed on a sloping chair, with a raising-flap to support the legs of the patient.

de Wecker has met with a case in which deafness, due to bilateral disease of the internal ears, complicated complete blindness, due to sympathetic ophthalmia; he has also collected three similar cases from the practice of other surgeons, and he has endeavoured to establish a relationship between these cases and those in which deafness complicates parenchymatous keratitis.

Detachment of retina.—de Wecker claims to have had satisfactory results from repeated injections, in recent cases, of concentrated saline solution beneath the capsule of Tenon. By substituting the liquid obtained from the vitreous of bovine eyes for water, he has been able to reach a salt-concentration of 30 per cent. without inflicting the severe pain which was inseparable from the use of the aqueous vehicle. A Paris chemist (M. Dufau prepares the solution for him under the name of chlorovitreine. de Wecker holds that the curative action of the injections is in direct ratio to the degree of concentration of the salt in the fluid. His views on this subject have been vigorously attacked in France.

(*To be continued.*)

Review.

"A Preliminary Report on a Parasite found in persons suffering from Enlargement of the Spleen in India."—By Lieutenant S. R. Christophers, I.M.S. (*Scientific Memoirs by Officers of the Medical and Sanitary Departments of the Government of India*, New Series, No. 8.) Office of the Superintendent of Government Printing, India, Calcutta. Price, Re. 1-8.

Those who have read recent numbers of the current medical journals will remember that in May 1903, Major W. B. Leishman, R.A.M.C., reported the discovery of parasitic bodies, which he suggested were possibly the remains of *trypanosomata*, in films taken *post-mortem* from the spleen of a soldier who had died from a fever apparently contracted in Dum Dum. In July 1903, Captain Donovan, I.M.S., announced that he had found similar bodies in blood obtained by splenic puncture from cases of enlargement of the spleen in Madras; and in January 1904, Professor Marchand and Dr. Ledingham published an account of a case in which similar bodies had been found in sections of the spleen, liver, and bone-marrow obtained at the autopsy on a soldier who had served in China. In the report which is now before us, Lieutenant Christophers states that, owing to the importance of the subject, he was directed to proceed to Madras to investigate the nature of the bodies discovered there by Captain Donovan. He discusses the question under the following headings:—(1) The clinical features of the cases in which the parasites are found; (2) the *post-mortem* appearances of cases; (3) the importance of the disease and its relation to *kala-azar;* (4) a description of the parasites and of their relation to the red blood corpuscles and to the leucocytes; (5) the distribution of the parasites in the body with an account of a new method of staining sections by a modification of Romanowsky's stain; (6) a comparison of the parasites with species of piroplasma. Some remarks are also made on the nature of the so-called "zooglea-mass" (Manson and Low).

Dr. Christophers tells us that the clinical features of the cases seen by him are extremely characteristic, the cardinal signs being—great enlargement of the spleen, emaciation, irregular pyrexia, and abdominal symptoms (diarrhœa and a dysenteric condition with blood and mucus in the stools). The *post-mortem* appearances were equally definite, an important discovery (besides the enormous enlargement of the spleen) being the fact that in all cases extensive ulceration of the large intestine was present. Dr. Christophers regards the disease as of very great importance, and considers that the cases seen by him in Madras were identical with cases usually diagnosed as "malarial cachexia with enlarged spleen",—a condition so well known throughout India. If this should prove to be correct, our knowledge of the anomalous types of Indian fever will have been greatly advanced. Dr. Christophers had an opportunity of examining a specimen from the spleen of a case of *kala-azar*, which contained numerous parasites, and in a footnote the remark is made by the Editor of the Memoirs that blood films from five cases of *kala-azar*, which were sent to Simla by Dr. Bentley, all contained the parasites in large numbers, so it would appear very probable that they are the cause of this disease. A very careful description of the parasites is given, and many new

points brought out. Their distribution in the body appears to be limited. Dr. Christophers found them in the spleen, liver, bone-marrow, mucous membrane and submucosa of the large intestine (especially in the neighbourhood of the ulcers), and in petechiæ from the arachnoid. They were never found in the peripheral blood, or in blood from the deeper vessels of the abdomen.

Dr. Christophers is of opinion that they never inhabit the red cells at any stage, and, chiefly for this reason, regards them as essentially different from parasites of the genus *piroplasma*. His discovery of the process by which ulceration of the intestine is brought about appears to be very important in view of the recently published paper by Dr. J. H. Wright, of Boston, on "Delhi Sore," for Dr. Wright's parasites which it would seem were discovered by Surgeon-Major D. D. Cunningham, I.M.S., as long ago as 1885, are to all appearances identical with the parasites under review.

Dr. Christophers states that at the present time it is premature to draw conclusions as to the zoological position of the parasites, and with this opinion we heartily concur, for much confusion has already arisen from neglect of this very desirable scientific caution. At the same time, however, he puts forward the suggestion that the parasites seen in the characteristic large cells possibly represent the spores of a *microsporidion*, a forecast which is similar to that made by Wright regarding the parasites found by him in a case of "Delhi boil." The report is illustrated with a large plate showing the parasite in all its phases, and with a smaller plate showing the method of division.

Aids to Surgery.—By JOSEPH CUNNING, M.B., B.S., F.R.C.S. (Eng.). Baillière, Tindall and Cox, London, 1904. F'cap. 8vo. Pp. 402. Price 4/6.

THIS little book is intended as a help to students preparing for an examination, and if only used as such it may prove helpful in revisal, for there is a great deal of condensed and well-arranged information collected in its pages. In its arrangement of subjects it follows the lines of Rose and Carless' *Manual of Surgery*. Thus, students reading the larger work can revise the subjects in the smaller book, though it is open to doubt whether this is as good training for them as making a synopsis for themselves of the larger text-books. Like the other publications in this series of "Aids" the book is well got up and in a very handy form.

Digest of Researches and Criticisms Bearing on the Revision of the British Pharmacopœia, 1898.—By W. CHATTAWAY, F.I.C. Spottiswoode & Co., London, 1903.

THIS is a highly technical compilation of pharmaceutical researches, criticisms and suggestions made between 1899 and 1902. It deals largely with the composition and assay of Drugs and Galenicals, and has been prepared at the instance of the Pharmacopœia Committee of the General Medical Council, with a view to the revision of the 1898 edition of the *British Pharmacopœia*.

Current Literature.

I.
REVIEWS OF LITERATURE ON INTESTINAL PARASITES.

THE subject of intestinal parasites has attracted a good deal of attention lately in the medical papers. This has been particularly the case in America where the discovery of an uncinaria of a new species, and with a wide distribution, has evidently evoked a deep interest.

In the *Journal of the American Medical Association*, September 19, 1903, is an article by Ward on "Precision in the determination of Human Parasites." He gives a list of the worms hitherto found as human parasites with their distribution by continents and emphasises the fact that recent investigation has shown that the distribution of certain species is much wider than has been hitherto supposed. Their evil effects he attributes partly to blood-sucking, partly to the excretion and absorption into the host of poisons which have been shown to affect chiefly the central nervous system and the formation of blood. He deplores the infrequency with which the fæces are examined under the microscope for the ova of worms, and mentions some structures which may be mistaken for the worms. The discussion which followed the reading of his paper added to these last, and it was stated that fibres from banana, cabbage, pineapple, rhubarb and celery had been mistaken for tapeworms, and masses of cells from the orange and lemon for flukes.

Dr. Allen J. Smith writes in the *American Journal of the Medical Sciences* on "Uncinariasis in Texas." The article gives a good description of the newly discovered American hook-worm Uncinaria Americana (Stiles). Among the differences between the new-world and old-world uncinaria is that in the former the teeth are situated in the depths of a buccal cavity capable of eversion instead of along its margin, and that in U. Americana segmentation of the ovum may have gone on to the formation or escape of a rhabdatidiform embryo before the evacuation of the fæces. He quotes Stiles as an authority for the statement that the U. Americana moults twice in the free state, the first moult being from two to three days, and the second from seven to eight days after evacuation. He describes eight cases of the infection and could get no history of ground-itch in any but the last. None of the patients were earth-eaters.

In the same number as Ward's article is one by Dr. Claude A Smith. He has found a very definite relationship between ground-itch and the amount of infection by uncinaria. He says :— "You can form a fair estimate of the number of eggs that you will find in the stools by taking a careful history of the severity and extent of the number of attacks of ground-itch "Many of the cases were suspected and located only on finding a history of having had ground-itch within seven years." And again, "You may take the history of some of the cases which have been at one time in the extreme stage, and you will find that they had attacks of ground-itch year after year, or probably skipping a year now and then, and they would get worse from year to year until they had attacks covering seven years or more, and probably they were old enough by that time to begin wearing shoes in the summer time : " He finds that after this there is a period of gradual improvement, due to the fact that there is no more infection of the body through the feet, and that the parasites already present gradually die from

old age. He considers that they do not live for more than seven years. If the infection is extreme during the period of growth, this is stunted, and puberty is delayed, and he gives some striking photographs illustrating this point. He has found the eggs to be destroyed by freezing or by drying, and also that development takes place best when they are mixed with sufficient dry earth to destroy the odour of the fæces.

The treatment is by purgation followed by two doses of thymol of 30 grs. each, followed by a second purgative, no food being given between the two purges. This gets rid of the parasites. He has not found the same ecchymoses in the gut of those affected as are found in the case of U. duodenalis, and has noted that the new-world parasite is not so firmly attached to the wall of the bowel as is the old-world one, a fact which he attributes to the absence of hooks round the edge of the mouth in U. Americana [This would partly explain the difficulty which has been described by some in getting rid of U. duodenalis in India.]

In *The American Journal of the Medical Sciences* for November, 1903, Dr. Charles F. Craig describes twelve cases of uncinariasis in soldiers of the U. S. army who had been invalided from the Philippines, and in all of them there was infection by uncinaria duodenalis, the old-world parasite. Allen J. Smith has also found evidence of the presence of U. duodenalis in America. Craig observed eosinophilia in nearly every case of uncinariasis.

The *Lancet* of December 5th, 1903, has an annotation on Ankylostomiasis in Westphalia. In the collieries here the German Government is taking active steps to stamp out the disease by the examination of men from different mines, the examination of all new hands taken on and the treatment of those affected, which last is carried out by calomel and male fern while fasting. The course of treatment is repeated if necessary.

In the same issue as contains Ward's article is one by Marshall Langton Price on "The Occurrence of Strongyloides Intestinalis in the United States." Section of the infected intestines showed "many eggs in various stages of segmentation, some containing embryos, seen generally lying at the bottom of the crypts of Lieberkuhn." About these the epithelium was atrophied, and the adjacent epithelial cells showed karyokinesis, while the stroma showed round celled infiltration. The symptoms are more or less continuous diarrhœa without fever, and accompanied by progressive loss of weight. His treatment consists in light diet, rest and tonics, with occasional heavy doses of thymol or filix mas followed by a purge. He has never found the treatment to cause the evacuation of the adult worm.

In *The Boston Medical and Surgical Journal* of December 3rd, 1903, Dr. J.C. Hubbard has an article on "Intestinal Parasites in Appendicitis." After describing two cases of general peritonitis following appendicitis in one of which two oxyures were found in the appendix, and in the other an ascaris was found free in the peritoneal cavity and a second one half way through an opening in the appendix, he goes on to consider the relationship of worms to appendicitis. Metchnikoff, he says, reports four cases of appendicitis, mostly recurrent, in which there were found in the stools ova of parasites. By getting rid of these he rid the patients of further attacks of appendicitis up to the time of report. Askanazy found in trichocephalus dispar a substance which reacted to the test for iron, and which he felt sure must come from the host's blood. He noticed that often at an autopsy the worm was so firmly adherent to the intestine that it could not be separated without rupture [such a specimen is to be seen in the museum of the Medical College, Calcutta], and that on cutting sections of such a bowel and worm the head of the latter was found imbedded in the mucosa, and that not in a pre-existing opening.

Girard, he continues, found an appendix removed in a case of general peritonitis to be quite healthy except where the head of a trichocephalus had penetrated it; here there was a zone of inflammation with a large number of mono and polynuclear leucocytes, cellular detritus, streptococci and colon bacilli. "It follows then that a trichocephalus may furnish the primary and direct cause for an attack of appendicitis." Askanazy similarly found in the intestines of ascaris an iron containing compound, which he considers must also have come from the blood of the host and have been obtained by sucking. Hubbard considers that the proof that the ascaris ever causes inflammation of the appendix by struggling within it to be less clear than in the case of trichocephalus, but thinks it probable that it could easily perforate an inflamed one.

The question of its ability to perforate the normal intestine he considers to be possible in view of a recently reported case in America. As regards oxyuris Hubbard has not found any evidence of its injuring the appendix other than would any other foreign body. In connection with this article of Hubbard's may be mentioned a case reported by Albert J. B. Duprey from St Lucia, West Indies, in the *Lancet* of December 12th. The boy had loose and offensive motions, fever, convulsions, and a distended abdomen. He lived four days in an unconscious condition, and after death there were found two round worms, one in the ileum and one with its head and half its body thrust into the appendix, the tail projecting into the cæcum. The intestines and all the other organs, including the meninges, were normal. In the same copy of the *Lancet* is an article by Dr. Andrew Balfour of Khartoum, giving a few figures suggesting that in both Bilharzia disease and in Guinea-worm disease there is eosinophilia.

The *Lancet* has recently contained other communications connecting ascarides with fever and convulsions.

C. L.

II.
SPECIAL SENSES.

In the *Journal of the American Medical Association* for October 3rd, 1903, appears a series of papers on the bacteria of the eye and ophthalmic asepsis. Randolph of Baltimore points out that we have not yet found any bacteria which are pathogenic only for the eye, though the possibility of such is suggested in sympathetic ophthalmia and trachoma. The micrococcus epidermidis albus and the xerosis bacillus are almost constant inhabitants of the conjunctival sac, though they only become pathogenic under certain circumstances not well understood at present. The colon bacillus has been found in almost pure culture in some cases of conjunctivitis. The staphylococcus aureus is also often present in apparently normal eyes. These four organisms are relatively less pathogenic. The gonococcus, diphtheria bacillus, Meik's bacillus, pneumococcus, Axenfeldt's diplo-bacillus and the tubercle bacillus are more strongly pathogenic. The streptococcus is very inconstant in its effects, sometimes virulent and at others present with little effect. The determining factor in cases where organisms are present is often an abrasion, a lowering of resistance to their invasion. The freedom from suppuration after penetrating wounds, and after operations, while due in no small degree to the natural resistance of the eye to the disease, is also, to no little extent, due to the feeble pathogenic properties of those bacteria so often found in the conjunctival sac. Randolph indeed looks forward to the day when antiseptic irrigations of the normal conjunctiva in cataract operations will have been abandoned.

Brown Pusey of Chicago refers to the difficulty we have in studying the bacteria of the eye, because many of the organisms will not grow in the conjunctivæ of animals. Even the gonococcus has never been found as a parasite in other animals. Deyl's work is quoted proving that chalazion is an 'infectious bacterial process,' the bacilli being identical with the xerosis bacillus, The disease has been experimentally produced in rabbits' eyelids by means of these bacilli. In cases of general

infection in animals produced by the introduction of organisms, *e.g*, pneumococci into the conjunctival sac, Römer and Hiroto conclude that the bacteria enter the circulation not directly from the conjunctiva but from the mucosa of the nose to which they are carried by the tears. The dependence of serpiginous ulcer of the cornea upon the pneumococcus is now well established, and the treatment of it by anti-pneumococcus serum is available.

Gifford of Omaha, in dealing with the essentials and non-essentials of ophthalmic asepsis, says we must keep in mind two fundamental propositions. First, that the conjunctival sac contains nearly always, if not always, germs which either are pathogenic or may become so. The second is that to rid the sac of these germs is a practical impossibility. A few cultures made from the retro-tarsal folds after an eye has been most carefully prepared for operation will soon convince any one of the truth of this. Even if an area of tarsal conjunctiva be exposed by a Desmarre's clamp and be scrubbed and treated with antiseptics, after waiting a minute or two germs will be found. After careful sterilisation of the lashes if the lashes are pulled out a growth of germs, usually white pus cocci, will be obtained from the roots. Even benzene does not remove these. With these premises it is evident th t many of the precautions required and taken by the general surgeon are unnecessary for the ophthalmic surgeon. As regards the patient's having a general bath, for instance, Gifford says: "while for esthetic reasons this may be eminently desirable, it seems to me that for an eye surgeon to have his patients take a full bath with any idea that he will on that account get better results from his operations, is on a par with the logic of the medicine man who beats a tom-tom to drive out the spirit of disease." Unless the skin of the eye-lids or face is going to be involved it is useless sterilising it. The lashes cannot be sterilised even with benzene, so they should be cut short and the stumps anointed with some sterile ointment to hold in the germs that are invariably left on them. Pulling them out, as recommended by Schiötz, is painful and causes marked reaction due probably to the increased activity of the germs inevitably left behind. The healthy conjunctival sac should be treated very gently. Gifford merely wipes it at the seat of incision with moist sterile swab, and for irrigation during or after operation uses sterile salt or borasic solution. Preparratory bandages are to be abjured. They always increase the number of germs in a normal sac. He places next to the eye after operation a layer of cotton that has been freshly boiled in boracic solution for ten minutes, covered with rubber tissue to keep it moist, and applies a binocular bandage, the sterilisation of which is a matter of no moment. The rest to the wound more than outweighs, he considers, the increase in the number of germs caused by bandaging. External violence is guarded against by a shield of some firm material. Instruments should all be boiled for ten minutes including cutting ones. Gifford has not seen injury from boiling in one per cent soda solution. Injury has been due to the instruments being rattled about unprotected, to prevent which points and blades should be wrapped tightly in cotton, and they should be wiped and re-wrapped immediately after use. Sterilising the operator's hands is very rarely necessary. Anything beyond a good scrubbing with sterile soap and water and careful drying on a sterile towel is a waste of time except in the rare cases where the surgeon must touch the tissue—such as in removal of an orbital tumour. On the other hand, Gifford regards the danger of germs falling on the operative field from the surgeon's head and face, and from nose and mouth, as real, and uses a double thickness of gauze about eight inches broad and a yard long, wrapped round the nose, mouth and chin (beard), the ends crossed behind the head and brought round so as to cover the vertex and forehead as well.

F. P. M.

III.
DISEASES OF WOMEN.

Coccygeal Tumour Obstructing Labour.—John T. Hewetson, M.D., F.R.C.S., (*Jour. of Obst. and Gynæcol. Brit. Emp.*, Mar., p. 203.)

A woman, aged 30, was in third labour. The former labours were normal. In the latter months of the present pregnancy the abdomen was unusually large, and there was much œdema of the legs. Labour was obstructed by a large tumour in the pelvis. Two medical men tried to deliver and brought down one leg in front of the tumour. After much difficulty the other leg was was brought down by a strong pull in which the foot was broken away. Fifteen hours after the onset of labour examination under chloroform showed a large fleshy tumour filling the pelvis. It was rounded and somewhat uneven, and had been broken into at its lowest part where it was discoloured from incipient decomposition. The fingers could be pushed into one or two small smooth-lined cavities. In latter attempts at delivery white firm portions broke away. In front, between the tumour and the pubic symphysis, one leg was presenting, the other was to the left and in front of the tumour; traced upwards the legs appeared to run into the tumour at its upper end. Posteriorly the hand could be passed between the tumour and the sacrum as high as the brim of the pelvis; the surface of the tumour here was smooth, and there was no connection with the bones of the pelvis. Attempts to deliver the tumour by pulling with volsellæ and fingers resulted in several portions being torn off. Traction with hand round the tumour and fingers dug into its substance succeeded in effecting the delivery of the mass, after which the rest of a dead female fœtus easily followed.

The tumour sprang by a broad pedicle from the anococcygeal region. Its circumference measured 14½ in., its greatest transverse diameter 5½ in., its greatest antero-posterior diameter 4 in, and its greatest vertical diameter 3¾ in. The tumour was surrounded by a fibrous capsule which was adherent only to the tip of the coccyx. A probe passed down the spinal canal reached the tip of the coccyx and then entered the capsule of the tumour. Microscopic examination showed that the tumour was an adenoma. It probably arose from the neurenteric canal or the coccygeal gland.

Diphtheria and Pregnancy.—Chambrelent and Micheleau (*Gaz. Hebdom. des Sciences Med. de Bordeaux*, May 17th).

A woman, aged 44, eight months pregnant, was admitted to hospital on 1st March with obstructive dyspnœa. Eight days before the throat became sore, and hoarseness, aphonia and dyspnœa soon followed.

There were stridor, retraction of the supra-clavicular and supra sternal fossæ and swollen cervical veins. The throat was red, but no membrane was seen. The temperature was 101·4°, and the pulse 120. Antitoxin was injected. Tracheotomy became necessary, and membrane was expelled through the wound. Two days later the dyspnœa recurred. In the left chest no respiratory sounds could be heard, and in the right the respiratory murmur was weak. Aspiration through the tracheal wound failed to remove any membrane. The fœtal heart was distinctly heard. It was decided to induce labour and make arrangements for Cæsarian Section should death occur. An œsophageal bougie was introduced into the uterus. It fell out after 2½ hours, and no uterine contractions were observed. Death took place on the following morning. An attempt to introduce the hand into the uterus in order to extract the fœtus failed, because the os was not dilatable. Cæsarian Section was immediately performed. The fœtus showed no signs of life, and could not be resuscitated.

Necropsy.—The larynx was covered with false membrane, but the trachea was free from it. The bronchi were lined with membrane. The lungs were emphysematous, and there was emphysema of the mediastinal tissue. In the small bronchi was sero-puru-

lent exudation. The membrane yielded on cultivation the long bacillus diphtheria and diplococci. It is noteworthy that there were no signs of uterine contraction although the asphyxia of pulmonary disease is regarded as one of the most important causes of abortion. The diphtheria bacillus was not found in the fœtus, but its toxins appeared to have produced profound changes in the fœtal organs. The myocardium showed signs of degeneration. There were interstitial hæmorrhages in the lungs. The spleen was congested and the seat of interstitial hæmorrhages. The liver also showed interatitial hæmorrhages, accumulations of leucocytes in the portal spaces, and degeneration of the hepatic cells. The kidneys showed similar but less marked changes.

Few cases of diphtheria in pregnancy have been recorded. All writers regard the condition as grave. Of twelve published cases in which antitoxin was not used six were fatal, but four cases in which it was used were all successful. There is a great tendency of the diphtheritic process to extend to the larynx, as in children, and contrary to the rule in adults.—*The Medical Review*

Puerperal Thrombosis of the Inferior Vena Cava.—By W. E. Fothergill, M.A., B.S.C., M.D.; and A. Knyvett Gordon, B.A., M.B. (*Jour. of Obst. and Gynæcol. Brit. Emp*, Mar., p. 218)

A multipara aged 30, was admitted to hospital on March 26th, as a case of puerperal fever. She had an easy labour on March 21st. On March 22nd she felt feverish, shivered and had headache. Next day she was delirious, and complained of abdominal pain. She became rapidly worse.

She was obviously ill and complained chiefly of pain in the lower abdomen, more intense in the right iliac fossa. The pain was dull and persistent, and had never been acute. There were headache and nausea. The temperature was 101·5°, the respiration 24, and the pulse 84. There was a little fetid mucopurulent vaginal discharge. The abdomen was slightly distended, but moved well with respiration. The uterus was tender, especially to the right of the middle line. The os was patulous, and the cervix split. Next day she was better, the discharge was less offensive, and the temperature was 99°. The uterus was explored with the finger, and the mucous membrane was found to be soft and friable throughout. An intra-uterine douche of weak iodine water was given. Next day the temperature rose to 104·2°, and she had a rigor lasting 10 minutes. The vaginal discharge was scanty and a little fetid. Another intra-uterine douche was given, and on March 29th the temperature fell, the discharge became odourless and increased, and she looked and felt better. On March 30th there was another rigor, and the temperature rose to 105° F., and there was some vomiting and hiccough. Another douche brought a little débris away. On March 31st she was much worse, vomiting frequently, and had great pain, which was referred chiefly to the umbilicus. The uterus was curetted under chloroform, and well scraped down to the muscle, several pieces of placenta being removed. Free bleeding followed. As the uterus failed to contract on manipulation, injections of hot water were given, ergot was injected subcutaneously, and the uterus and vagina were plugged with sterilised gauge. Subsequently a large saline enema was given and retained. The patient was blanched and collapsed. Next day she was more comfortable. The plugs were removed, and the uterus douched with hot water. It contracted firmly. The temperature, however, remained high and remittent, and rigors occurred at intervals. On April 6th the temperature, as registered by three different thermometers at 6 P.M., was 111·2°. But there was no collapse, and the temperature fell to 107·0° after hot sponging. Phenacetin, grs. 10 in 2 oz. brandy was given, and the temperature fell to normal. There was pain and tenderness over the right saphenous opening which was followed quickly by signs of thrombosis of the femoral and saphena veins. Two days later the same process followed on the other side, and both legs were œdematous. Subsequently a cord was felt in the situation of each popliteal vein. The temperature contained high and remittent with repeated rigors. The patient became weaker, and died on May 14th. The immediate cause of death was œdema of the lungs.

Necropsy.—The pelvic organs were normal, except for an old split in the cervix. There was no sign of peritonitis. The inferior vena cana was filled with firm *ante-mortem* clot, which extended into the iliac and renal veins. In fact all veins below the heart were filled with clot. The lungs were œdematous, the heart muscle was pale and flabby and the right pleura contained a little serous fluid.

At the outset there was simply septic infection of retained portions of placenta. Their presence and the inflammation due to their infection must have kept the uterine sinuses of the placental site very large, for during the curetting blood gushed out from the os in a spout an inch in diameter. Albumin appeared in the urine a week before death, when probably at least one of the renal veins was thromboosed.

Thrombosis of the inferior vena cava is usually secondary to thrombosis in a tributary vein. In but few cases has the primary thrombosis occurred in the utero-overian and hypogastric veins. In 1828 Dance showed that a puerperal inflammation in the wall of the uterus affected the right ovarian vein and then the vena cava. Leudet described a case of phlebitis in the utero-ovarian veins, iliac veins and vena cava, with clotting extending into the right renal vein. Lanceraux also mentions thrombosis of the utero-ovarian and hypogastric veins, with extensions in the femoral and renal veins, the vena cava being obliterated up to the diaphragm. All these cases were puerperal. In another case the thrombosis followed phlebitis secondary to vaginitis, which was caused by a pessary.—*The Medical Review.*

J. W. F. R.

ANNUAL REPORTS.

REPORT ON THE CIVIL HOSPITALS AND DISPENSARIES UNDER THE GOVERNMENT OF BOMBAY FOR 1902.

Though the tabular statements of this report extend to over one hundred pages, the actual text of the report has to be condensed to within a limit of three pages. The total number of sick treated was 4,031,185, of whom 67,377 were in-door patients. The plague cases reported numbered 290,831, and there were 215,591 deaths from this disease,—a considerable increase on the year previous. The total number of surgical operations was 46,811. The were 4,049 operations on the eye and its appendages, including 879 extractions of the lens; of 67 herniotomies, 36 were for strangulation. Amongst 257 cases of abscess of the liver there were 69 deaths. In 1,300 operations for the removal of vesical calculi there were 808 litholapaxies, 408 lithotomies and 84 lithotrities, with 53 deaths. The total expenditure was Rs. 11,67,178, of which. Government paid 54·6 per cent., and the average cost per patient was nine annas.

NOTES AND STATISTICS ON HOSPITALS AND DISPENSARIES IN BURMA, 1902.

The number of hospitals and dispensaries was 177, in which an aggregate of 925,414 patients were treated; of these 42,168 were in-door patients. The Rangoon General Hospital has 461 beds, in which 7,399 in-patients were treated, while 51,315 out-patients were treated. At the Dufferin Hospital 606 in-door and 1,535 out-door patients were treated. Mosquito curtains are used in all the hospitals, and their adoption by soldiers in barracks has been recommended. The prophylactic use of quinine is general during the fever season. There were 139,105 entries under the head of malarial fevers, and 669 cases of beri-beri were treated at the Rangoon General Hospital. There were 22,410 surgical operations, with a mortality of ·64 per cent. As a possible index of the distribution of cataract and stone in Burma, it may be noted that there were only 60 extractions of the lens, and only 46 operations for vesical calculus,—21 litholapaxies, 21 lithotomies and 4 lithotrites. There were 71 herniotomies. The expenditure was Rs. 7,88,265-5-5. The total invested capital amounts to only Rs. 13,250. The Rangoon General Hospital has been taken

over by Government from the Rangoon Municipality. There appears to be some difficulty in recruiting Civil Hospital Assistants for service in Burma, so there is a proposal to start a local medical school.

NOTES ON THE ANNUAL STATEMENTS OF THE DISPENSARIES AND CHARITABLE INSTITUTIONS OF THE PUNJAB FOR 1902.

THERE were 249 dispensaries, the in-patients treated numbered 50,138, which is somewhat less than in the previous year, the diminution being, to some extent, due to plague, because the other patients are apt to hurry away from hospital as soon as they hear of a plague death, and for some time afterwards they are shy to seek admission. The number of beds available was 2,939, including 901 for women. There were 2,968,988 out-patients treated. There were 475,985 entries for malarial fevers—a decrease of no less than 74,734 to the previous year. On the other hand, there was an increase of over 60,000 eye cases treated, including 5,700 extractions of the lens for cataract. There were 153,408 surgical operations, including 2,031 for stone in the bladder with 63 deaths, 111 herniotomies with 5 deaths, and 134 for abscess of the liver with 6 deaths. The expenditure was Rs. 5,43,907. The total investments in Government securities was Rs. 1,20,783-14-0. The voluntary subscriptions by natives of India fell to Rs. 8,291, or only 1·5 per cent of the total dispensary income; but the proportion contributed by local bodies had risen to 91·9 per cent.

REPORT ON THE ADMINISTRATION OF THE SALT DEPARTMENT DURING 1902-1903.

THE rate of duty upon salt manufactured in British India (excepting Burma, Kohat and Aden), or imported by land, was reduced from Rs. 2-8 to Rs. 2 per maund in March 1903. Nearly half the total imports came from the United Kingdom; but salt from Aden and the Red Sea is steadily displacing British salt. Imports from the Persian Gulf ports have also decreased. The varieties of salt which usually show least wastage are known as Hamburg, Salif and Muskat Salt. In Calcutta the annual average consumption of salt came to about 14 lbs. per head of the population. The general health of the Salt Department's officials was bad, many suffered severely from malarial fever, and several from cholera.

TRIENNIAL REPORT ON THE LUNATIC ASYLUMS IN THE MADRAS PRESIDENCY FOR 1902.

THERE are three asylums—at Madras, Vizagapatam and Calicut, having a combined total population of 736 for the year—564 males and 172 females. The daily average number was 579·95. There has been a steady rise in numbers during the past three years. The maximum number confined at one time in the Madras Asylum was 410, in Vizagapatam 80 and 107 in Calicut. Criminal lunatics are not received in the two last-named asylums, in the Madras Asylum alone are they admitted, and here there were only 37 admissions. There were 132 admissions for mania, 14 for melancholia, 9 for dementia, and 6 for idiocy. Of the 736 treated 70 per cent. had mania, 7 per cent. melancholia, and 15 per cent. dementia. In all three asylums the dry-earth system is carried out, and is worked satisfactorily. The chief employments were gardening, weaving, dairy-farming, sewing, knitting, tape-making and coir twisting. Patients were also employed for domestic purposes, cooking, tailoring, washing, &c. A good deal seems to be done to enliven the lot of these unfortunates in the way of amusements. The average daily sick of the three asylums was 47·91, and the chief diseases were malarial fevers, mania, epilepsy, tubercle, surfeit, dysentery, diarrhœa and wounds. The total number of deaths was only 45. The Madras death-rate was 9·66, Calicut 4·97, and Vizagapatam 1·32. The chief causes of mortality were tubercle of the lung, dementia, epilepsy, dysentery and valvular diseases of the heart. Captain C. B. Harrison, I.M.S., was in charge of the Madras Asylum, Major W. C. Vickers, I.M.S., at Vizagapatam, and Lieutenant-Colonel T. J. Hackett Wilkins, I.M.S., at Calicut. In the Madras Asylum there is a special nursing establishment for patients on the sick list.

Correspondence.

LEISHMAN-DONOVAN BODIES IN "MALARIAL CACHEXIA" AND KALA-AZAR.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—The discovery by Leishman of parasite-like bodies in a case of chronic fever from Lower Bengal, and more specially the work of Donovan in showing that these bodies are commonly present in the spleens of very chronic fevers with great enlargement of that organ in Madras, has raised the very important question as to whether the class of cases always hitherto known as "Malarial cachexia," together with the epidemic form of the disease in Assam known as Kala-azar, might not be due to the new parasite. On my return from leave recently, I was fortunate enough to have an opportunity of investigating the prevalence of fevers in one of the very districts in which kala-azar took its origin in the early seventies, while thanks to the kindness of my old friend Dr. Dodds Price of Nowgong (whose experience of the disease is unique), in sending me some slides of spleen punctures made in kala-azar cases, I have been able to find the bodies in the spleens in both the endemic and epidemic forms of the disease. I found them to be identical with each other and with to agree exactly with those in a slide shown me by Major Leishman, and also in one kindly sent me by Major Donovan, as well as with those recently figured by Manson and Low. So far I have only found them in a small proportion of cases of fever with a large spleen, some of the others having been ordinary malarial cases, and much further work will be required to differentiate the two diseases, in the earlier stages more specially. Should, however, further experience prove all the markedly cachexial cases to be due to the new parasite a most important advance will have been made.

It will be remembered that the main argument in my original report on kala-azar was that individual cases, both clinically and pathologically, were indistinguishable from ordinary "malarial cachexia," only the disease was present in Assam in an epidemic spreading form. If, however the endemic form is really a special fever with a parasite differing somewhat from the malarial one, although closely related to it among the protozoa, then my main argument will not be affected, while the practical results obtained in Assam on the tea gardens by Dr. Dodds Price and others will receive an extended application. These include the very successful segregation measures and the absolute value of quinine as a prophylactic, first demonstrated by Dr. Dodds Price, and its great value in large doses in the treatment of cases not too advanced. The exact manner of origin of the epidemic form will still have to be explained, as the finding of a form of protozoa differing from the malarial parasite will not *per se* throw much light on the matter.

As the highest authorities on the subject are at variance with regard to the nature of the parasites, it will be useless at this stage to add one more to the guesses already made, but one thing is clear that no forms resembling full-grown trypanosoma have been found by any observer. I should add that the observations referred to in this communication were all made before the appearance of Dr. Bentley's recent announcement of his abandonment of his Malta fever theory in favour of that of Major Donovan that the disease is due to the new form of parasite.

Finally, I would suggest the term "Cachexial Fever" as a convenient name for the endemic form of the disease until further advances in our knowledge admit of a more suitable one being agreed on.

CALCUTTA, *March* 1904. I am, etc., LEONARD ROGERS, M.D., I.M.S.

THE PIROPLASMATA IN MAN.

DEAR SIR,—Will you spare a small space in your next number for this letter?

A species of Piroplasma has been found in several cases both by Dr. A. Lingard, Imperial Bacteriologist, and myself in human blood. Dr. Lingard has found the Piroplasma Bigeminum in every animal that he has under observation, and in two men also working in his Laboratory.

I have seen it in the blood of several prisoners. This has been verified by Dr. A. Lingard. The intermediate host I believe is a Culex. A paper on the above subject will be sent as soon as the facts in relation to the intermediate host have been worked out.

BAREILLY, *March 11th*, 1904. E. JENNINGS, *Major, I. M. S.*

PIROPLASMATA IN MAN AND THE LOWER ANIMALS.

In 1902 I reported the presence of the *Piroplasma bigeminum* in cattle brought from the neighbourhood of the Jamna and Ramganga rivers, and in 1903 described a spontaneous form of Piroplasmosis in country-bred donkeys from the Bareilly District.

Up to date several different species of Piroplasmata have been described as affecting animals in various countries, *viz.*:—

Piroplasma bigeminum.
" ovis.
" canis.
" equi.

At the present time I have the following animals, the subjects of spontaneous disease, all of which exhibit Piroplasmata in their red corpuscles, and free in the blood plasma.

1. Bovines—Plains and Hill cattle.
2. Equines—T. B., English, Australian, Arabs, country-bred horses, tatoos and donkeys.
3. Camels—from Bikanir.
4. Sheep—
5. Goats and kids—the latter only a few (2) weeks old.
6. Dogs—imported English and Pariahs.
7. Rabbits—country-bred.
8. Guinea-Pigs—country-bred.

Further the blood of several Native Assistants, Laboratory Attendants and my own, contain the same forms of Piroplasma, which are united in couples of one to three in the affected red blood cells. The blood of an eight months foal, born dead, mother a hill pony, exhibited all the different forms of the Piroplasma, so that it is capable of passing through the placental walls from the maternal to the fœtal circulation.

In this instance it would appear that man and animals alike all present the same species of Piroplasma, but slight modifications in the specific characters of the hæmotozoon are probably developed during the passage through the different animals,

A. LINGARD,

March 11th, 1904. *Imperial Bacteriologist.*

SULPHONAL IDIOSYNCRASY.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I was much interested in the case reported by Military Assistant-Surgeon E. J. Murphy in the *Indian Medical Gazette* of March 1904.

Having used sulphonal extensively in asylums, prisons, hospitals and private practice and invariably in large doses, it might interest your correspondent to learn that I have never had any bad results therefrom, and that I consider it a safe hypnotic without depressant action on the heart. Your correspondent hints that a larger dose would have had a serious depressant action on the heart in his case, but the case in which he gave it being a cardiac case is one in which sulphonal does not act to advantage as an hypnotic. This is one objection to the use of sulphonal. Another objection is that it is slow in action owing to slow absorption from the intestinal tract. This slow absorption necessitates that the bowels be emptied, and it should not be given with constipation, otherwise its absorption is not only delayed, but the sulphonal is liable to undergo decomposition and you get not the hypnotic effect of sulphonal, but the effects of the products of its decomposition. This I venture to state is what probably happened in his case. Hence the rash. A weak heart, one can understand, would aid this effect.

I can only find two fatal cases having been reported. One where the patient took more than one ounce (*B. M. J.*, ii, 1890), and the other reported by Schulz (*B. M. J.*, November 28th, 1896, whose patient had taken ½ oz. within a month and then took 25 grains. Walters has reported two cases of eruption like scarlet fever following use of sulphonal (*Ther. Monat.*, 1889, No. 12).

Your correspondent does not state (1) if his patient was constipated; (2) if the bowels were opened before the drug was given; (3) if urine was coloured brownish-red (due to hæmatoporphyrin); (4) whether there was a smell of acetone in the breath (proving its decomposition).

In conclusion I may add (1) that I believe sulphonal is safe and non-depressant to the heart; (2) useless as hypnotic under 15 grains; (3) should be given nine hours before action is required; (4) that action is accelerated by hot solution of it, and I have found much accelerated in hot whisky and water; (5) that other hypnotics act better in heart disease; (6) that the bowels should always be opened beforehand, and this more especially in cases of chronic constipation; (7) that I have given it in 60 grain doses to cases of acute delirium where other hypnotics had failed, and with success and without any bad effects.

A. G. NEWELL, M.D., D.P.H.

Calcutta, 17th March, 1904.

Service Notes.

THE JAPANESE MEDICAL SERVICE.—Each unit of each arm of the service has its own medical staff—and a very complete one, too—which forms an integral part of equipment. A most important point is that the medical department has its own transport, and is therefore not dependent on the goodwill of the commissariat corps. As wastage occurs in the ranks and men are moved to hospital, a proportionate part of the medical staff goes with them, so that the ratio between the officers serving in the field and the officers serving in hospital varies according to the demands for each. The discretionary powers left in the hands of the executive in the field are very large, and references to headquarters are reduced to a minimum. If a medical military *attaché* were to accompany the Japanese army, there is little doubt but that he could supply our War Office mandarins with some information that would be better for the rank and file of the Army than for their own dignity.—*The Medical Press and Circular.*

TENURE OF STAFF APPOINTMENT.—Principal Medical Officer, His Majesty's Forces, and Surgeon-General, Army Medical Service; also Colonels, R. A. M. C.—tenure unlimited. Principal Medical Officer, His Majesty's Forces, Surgeon-Generals and Colonels, Indian Medical Service,—tenure limited to five years.

COLONEL A. M. BRANFOOT, C.I.E., I.M.S., retired, is appointed President of the Medical Board, India Office, upon the retirement of Surgeon-General Sir W. R. Hooper, K.C.S.I.

CAPTAIN W. G. LISTON, M.D., I.M.S., is appointed to officiate as Civil Surgeon of Sambalpur.

MAJOR A. E. ROBERTS, I.M.S., has been permitted to return to duty before the expiry of his leave.

CAPTAIN C. A. LANE, I.M.S., is appointed Second Surgeon, Presidency General Hospital, with effect from 5th June 1903.

CAPTAIN L. ROGERS, I.M.S., is appointed First Surgeon, Presidency General Hospital, with effect from 5th June 1903.

MAJOR B. C. OLDHAM, I.M.S., is appointed Civil Surgeon, Birbhum, but will continue to act as Civil Surgeon, Darbhanga.

THE services of Major R. Bird, I.M.S., were placed at the disposal of the Government of India, Home Department, with effect from 1st January 1904.

CAPTAIN A. F. STEVENS, I.M.S., is appointed Resident Surgeon, Eden Hospital, Calcutta, but will continue to act as Civil Surgeon, Shahabad.

THE services of Captain N. R. J. Rainier, I.M.S., and of Captain A. M. Fleming, I.M.S., are placed permanently at the disposal of the Chief Commissioner, Central Provinces.

CAPTAIN A. E. WALTER, I.M.S., is placed on special duty under the orders of the Director-General, I. M. S., on his arrival in Bombay.

LIEUTENANT-COLONEL H. K. MCKAY, C.I.E., I.M.S., is granted the temporary rank of Colonel whilst officiating as P. M. O., Presidency District, *vice* Colonel B. O'Brien, M.D., I.M.S., transferred temporarily to the civil department.

MAJORS to be Lieutenant-Colonels. *Bengal*:—J. J. Pratt, I.M.S., R. Shore, M.D., I.M.S. *Madras*:—W. B. Bannerman, M.D., I.M.S., H. Thomson, M.B., I.M.S. *Bombay*:—C. J. Sarkies, M.D., I.M.S.

RETIREMENT.—Lieutenant-Colonel H. A. F. Nailer, M.B., I.M.S., 20th October, 1903.

Lieutenant-Colonel W. K. Hatch, M.B., F.R.C.S., I.M.S., 15th November, 1903.

Lieutenant-Colonel D. F. Barry, M.D., I.M.S., 10th December, 1903.

MAJORS T. B. WINTER, G. D. Hunter, D.S.O., A. R. Aldridge and R. J. W. Mawhinny, and Captain S. A. Archer, all R.A.M.C., have passed the examination in Military Law.

THE services of Captain W. E. A. Armstrong, I.M.S., are replaced at the disposal of the Foreign Department.

THE services of Captain W. M. Pearson, I.M.S., are placed temporarily at the disposal of the Chief Commissioner, Central Provinces, for employment in the Jail Department.

LIEUTENANT-COLONEL W. A. SYKES, D.S.O., I.M.S., is appointed Administrative Medical Officer in Baluchistan.

LIEUTENANT-COLONEL P. A. WEIR, I.M.S., is appointed to officiate as Administrative Medical Officer in the North-West Frontier Province.

CAPTAIN H. INNES, I.M.S., acts as Civil Surgeon of Backergunge, during the absence of Lieutenant-Colonel R. Cobb, I.M.S.

MAJOR B. H. DEARE, I.M.S., acts as Civil Surgeon of Rajshahi, during the absence on deputation of Lieutenant-Colonel J. Ffrench Mullen, I.M.S.

CAPTAIN E. A. R. NEWMAN, I.M.S., acts as Civil Surgeon of Hazaribagh, during the absence on deputation of Lt.-Col. R. Macrae.

THE services of Captain L. Rogers, I.M.S., deputed on special fever duty, are placed temporarily at the disposal of the Government of India in the Home Department.

LIEUTENANT-COLONEL G. A. EMERSON, I.M.S., is appointed Civil Surgeon of Ghazipur.

THE services of Captain T. S. Ross, I.M.S., and of Captain W. H. Tucker, I.M.S., are placed permanently at the disposal of the Government of Madras.

THE services of Captain F. N. Windsor, M.B., I.M.S., are placed permanently at the disposal of the Government of the United Provinces.

THE services of Captain H. M. Moore, I.M.S., are placed permanently at the disposal of the Government of Bombay.

COLONEL C. W. CARR-CALTHROP, M.D., I.M.S., has been permitted to retire from the service, with effect from the 2nd April 1904.

LIEUTENANT F. E. WILSON, I.M.S., assumed charge of the Civil medical duties of Chitral on the 14th December, 1903.

MAJOR W. R. EDWARDS, C.M.G., M.D., I.M.S., the Residency Surgeon in Kashmir, has been granted one year's combined leave, and Major H. E. Drake-Brockman, I.M.S., takes his place.

CAPTAIN V. G. DRAKE-BROCKMAN, I.M.S., is posted as Agency Surgeon, Eastern Rajputana States.

COLONEL A. M. BRANFOOT, C.I.E., I.M.S. (retired), is granted the temporary rank of Surgeon-General.

INDIAN MEDICAL SERVICE.—*To be Lieutenants from 1st September*, 1902—F. P. Connor and G. H. L. Whale; *from 31st August*, 1903—R. Kelsall, M.B., J. H. Burgess, M.B., J. M. A. Macmillan, M.B., C. A. Gill, W. E. J. Tuohy, T. F. Owens, R. F. Steel, M.B., G. F. I. Harkness, A. C. Ingram, M.B., G. W. Maconachie, M.B., E. W. C. Bradfield, M.B., C. I. Brierly, J. B. D. Hunter, M.B., E. T. Harris.

RETIREMENT.—Lieutenant Colonel Haslett Alison, M.D., I.M.S., on the 23rd December, 1903; Major I. P. Doyle, D.S.O., I.M.S., on the 31st December, 1903; Lieutenant Colonel J. Lancaster, I.M.S., District Medical and Sanitary Officer, North Arcot, has been permitted to retire from the 17th February, 1904; Lieutenant-Colonel T. H. Pope, I.M.S., Superintendent of the Government Ophthalmic Hospital, Madras, has been permitted to retire from the 1st March 1904.

MAJOR F. WYVILLE-THOMSON, I.M.S., has been granted one year's furlough.

LIEUTENANT-COLONEL J. P. BARRY, M.B., I.M.S., on return to duty, is appointed Presidency Surgeon, Second District, Marine Surgeon, and Superintendent of the Lunatic Asylum at Colaba.

LIEUTENANT COLONEL R. J. BAKER, M.D., I.M.S., is appointed Civil Surgeon, Belgaum.

CAPTAIN C. H. STRATON, R.A.M.C., is appointed to the medical charge of the civil station of Dinapore in addition to his regimental duties.

MAJOR S. J. W. HAYMAN, R.A.M.C., is appointed to have charge of the civil medical duties of Barrackpore in addition to his charge of the Station Hospital.

SURGEON-GENERAL W. F. BURNETT, A.M.S., officiates as P. M. O., H. M. Forces in India, during the absence of Surgeon-General Sir T. J. Gallwey, K.C.M.G., C.B., with effect from the 5th March 1904.

THE *late* Colonel R. de la C. Corbett, M.D., D.S.O., R.A.M.C., had been appointed to officiate as P. M. O., Bengal Command, with the temporary rank of Surgeon-General, *vice* Surgeon-General Burnett.

LIEUTENANT-COLONEL A. W. P. INMAN, M.B., R.A.M.C., is granted the temporary rank of Colonel, while officiating as P. M. O. of a district, *vice* Colonel Corbett.

LIEUTENANT F. NORMAN WHITE, I.M.S., assumed charge of the civil medical duties of Chakdara, relieving Lieutenant S. H. Lee Abbott, I.M.S.

THE services of Lieutenant-Colonel R. Macrae, I.M.S., Civil Surgeon, Hazaribagh, are placed temporarily at the disposal of the Government of India to act as A. M. O. in Central Provinces.

MAJOR R. H. ELLIOT, F.R.C.S., I.M.S., is appointed Ophthalmic Surgeon, Madras, *vice* Lieutenant-Colonel Pope, retired. We congratulate Major Elliot on his appointment to a post which his writings in this Journal show that he is well fitted for.

LIEUTENANT-COLONEL BOMFORD, M.D., C.I.E., has gone to Punjab as Inspector-General of Civil Hospitals.

LIEUTENANT-COLONEL R. D. MURRAY, I.M.S., has gone to Lucknow as Inspector-General of Civil Hospitals, and Major R. Bird, M.D., F.R.C.S., will act as Professor of Surgery.

MAJOR D. M. MOIR, M.D., I.M.S., will again officiate as Professor of Anatomy, Calcutta, on Lieutenant-Colonel Charles going on leave in April.

MAJOR W. J. BUCHANAN, M.D., I.M.S., on return from furlough, has resumed his post of Inspector-General of Jails, Bengal.

MAJOR R. J. MACNAMARA, M.D., I.M.S., on being relieved, went to Punjab to act as Inspector-General of Jails for Colonel T. E. L. Bate, I.M.S., C.I.E.

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will **receive 25 Reprints gratis**, if requested.

Communications on Editorial Matters, **Articles, Letters and Books for Review** should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscriptions to the Indian Medical Gazette, Rs. 12, including postage, in India. Rs. 14, including postage abroad.

BOOKS, REPORTS, &c., RECEIVED.

The Thompson Yates and Johnston Laboratories Report. Vol. V, New Series, Part II, December, 1903.

The University Press of Liverpool. Longmans, Green & Co. Price 12/6

Administration Report of the Public Works Department, Madras, 1902-1903.

A Report on Hæmorrhagic Septicæmia in Animals in the Philippine Islands. By P. G. Woolley, M.D., and J. W. Jobling, M.D. Biological Laboratory, Manila.

A Report on two cases of a Peculiar Form of Hand Infection. By J. R. McDill, M.D., and W. B. Wherry, M.D. Biological Liboratory, Manila.

Report on the Working of the Thagi and Dakaiti Department for 1902.

Digest of Researches and Criticisms bearing on the Revision of the British Pharmacopœia, 1898. By W. Chattaway, F.I.C., 1899 to 1902, inclusive. Spottiswoode & Co., London, 1903.

Manual of Operative Surgery. By H. J. Waring, F.R.C.S. 2nd Edition, 1904. Young J. Pentland, Edinburgh and London.

Diseases of the Gall-Bladder and Bile-Ducts, including Gall-Stones. By A. W. Mayo Robson, F.R.C.S., assisted by J. F. Dobson, F.R.C.S. Baillière, Tindall and Cox, 1904.

A Manual of General Pathology. By Sidney Martin, M.D., F.R.S. F.R.C.P., John Murray, London, 1904.

ACKNOWLEDGMENTS, COMMUNICATIONS RECEIVED.

Colonel K. McLeod, M.D., I.M.S. (*retired*), London; Capt. E. R. Rost, I.M.S., Rangoon; A. G. Newell, M.D., Calcutta; T. A. Bailey, Esq., Nasik. Lieut.-Col. J. Smyth, I.M.S., Bangalore; Lieut.-Col. D. G Crawford; I.M.S., Chinsura; Capt. A. Chalmers, I.M.S., Kurnool; Capt R. H. Maddox, I.M.S., Ranchi; Capt. D. McCay, I.M.S., Calcutta; Capt E. O. Thurston, I.M.S., Calcutta; Military Asst.-Surgn. A. T. Torpy, R.I.M.S. "Clive"; Capt. Clayton Lane, I.M.S., Calcutta; U. C. Ghose, L.M.S., Noakhali; Dr. C. A. Bentley, Tezpur; Capt. Leonard Rogers, I.M.S., Dinajpur; Lieut. G. P. Davys, I.M.S., Tibet; Dr. B. R. Sawhney, Jammur.; Major C. N. C. Wimberley, I.M.S., Sikkim; Major W. D. Sutherland, I.M.S., Hoshangabad; Major E. Jennings, I.M.S., Bareilly; Dr. A. Lingard, Bareilly; Asst.-Surgn. Ram Narain, L.M.S., Delhi.

Original Articles.

A PRELIMINARY NOTE ON A PYROPLASMOSIS FOUND IN MAN AND IN SOME OF THE LOWER ANIMALS.

BY A. LINGARD, M.B.,

Imperial Bacteriologist to the Government of India; and

E. JENNINGS,

MAJOR, I.M.S.

IN 1902 hæmoglobinuria of cattle due to the presence of the pyroplasma bigeminum * made its appearance in plains cattle at the Bareilly Laboratory after the subcutaneous inoculation of rinderpest blood. In the injected cattle, the symptoms of the second disease followed before those of the primary one had disappeared. The injected blood was found to be free from the parasite, and no other cattle out of some 90 inoculated showed symptoms of any disease but rinderpest. It was therefore pointed out that the organism is able to lie dormant in the system of some of the plains cattle of this province, until such time as the restraining power present in the blood has been modified, or removed, when it again assumes an active state. Further, the reduction or entire removal of the hereditary or acquired resistance to the pyroplasma bigeminum may, in some cases, be materially hastened by such animal passing through an attack of any other febrile disease, which brings about depressing conditions. Whether the years 1902-1903 were exceptional ones in the plains of India we are not as yet in a position to say, but all animals which have come under observation of whatever species, with the exception of bovines and buffaloes received from the Himalayan regions at Muktisar, and these at times may perhaps be carriers of the same, have without exception respectively exhibited pyroplasmata in their red corpuscles and free also in the plasma. Further, all Himalayan animals, bovines and buffaloes, after coming across the Bhabar and Terai regions, belts of land lying between the foot of the outer Himalayas and the Bareilly district, have exhibited the same organisms. The presence of these pyroplasmata are not confined to the Bareilly district, but are more or less scattered over a large area of North India; the following facts indicate:—

Shamsher and *Kilogarth*, an Arab and a T. B. English stallion respectively, brought the organisms in their blood from the North Punjab. Three mares, railed direct to Kathgodam from Hapur Remount Depôt in May 1903, exhibited the organisms in their circulations a few days after their arrival at Muktisar. Donkeys taken to the Hill Laboratory in July 1903 exhibited the same parasites in their blood shortly after their arrival. Specimens of blood from brood mares suffering from surra, and guinea-pigs inoculated with blood from affected animals in the Maindot State, Punjab, all exhibited the same form of organism in their respective circulations. Up to date the following animals have been found to be the subjects of spontaneous pyroplasmosis in Bareilly:—

1. Bovines, plains and hills animals.
2. Buffaloes „ „
3. Equines, English, Australian Arabs, country-bred horses, "*tatoos*" and donkeys.
4. Elephants.
5. Camels.
6. Goats and kids (latter a few weeks old).
7. Sheep, from Bareilly district.
8. Dogs, English and pariahs.
9. Cats, tame and wild.
10. Monkeys.
11. Several species of deer.
12. British breeds of fowls.

White rabbits, guinea-pigs and rats (*m.d.*) have been inoculated with the pyroplasmata. The blood of an eighth month foal born dead, the mother a hill pony, exhibited all the different forms of the asexual variety of the pyroplasma in the red corpuscles and blood plasma, in addition the blood of a donkey fœtus, about the fifth month, contained the organism. So that the parasite is capable of passing from the maternal to the fœtal circulation through the walls of the placental vessels.

It would appear probable that man and animals alike in certain seasons, may all present the same species of pyroplasma, but modifications in the specific characters of hœmatozoon are developed during the passage through the different animals.

Smith and Kilbourne proved that ticks are the carriers of the pyroplasma bigeminum from one season to the following, and young ones hatched out from the eggs were capable of conveying the disease to any susceptible cattle they attach themselves to. Koch has shown that young ticks placed on blades of grass on the veld are but little influenced by the exposure to wind and weather, the young ones huddle together at the extremity and under-surface of the blades of grass, ready to transfer themselves to any animal which comes in immediate contact with them, and further the same breed of bovines which were incapable of contracting the pyroplasma by the inoculation of infected blood, readily took the disease spontaneously in a severe form when exposed to the bites of infected ticks on the veldt.

Here then we have one way explained as to the means by which the pyroplasma is carried over from one season to another in animals. But man is not infected with ticks except under

* The spelling of the word, piroplasma or pyroplasma, is uncertain and should be agreed upon.—ED., *I. M. G.*

exceptional circumstances, and therefore it becomes necessary to search for some other species of carrier. Our attention was naturally turned to the culicidæ and the biting forms of the diptera, but in the cold season but few if any of the latter species are to be found.

As before mentioned culices were present in force during January and February for they began to hatch out in December, and C. Fatigans and C. Annulatus were very numerous, especially the former variety.

On examination of stagnant and dirty water from puddles which were left, dried up after the *pucca* monsoon and also those after the winter rains, the parasitical elements of the disease were found in large numbers, although they were not present in recently fallen or running water, but in puddles which dried up and later re-formed after a further fall of rains, the elements of disease were nearly always forthcoming, so that neither cold nor dessication destroys the parasitical elements.

Further in the eggs, larva pupa and C. Mosquitoes, obtained from dirty water puddles, the parasites in one form or another were frequently demonstrated. The larva took in other low forms of life as food, and contracted the parasites from them or are carried over to them in the eggs, as in the case of the tick. The parasites were also found in anopheles mosquitoes, but too late to act as the intermediate hosts, for they were not present in January and February and were only hatched out in the middle of March and then only in small numbers, the first being discovered this year on the 15th of March.

The question as to culex causing this disease in man has been gradually forced upon us, for two years ago, out of a population of 2,500 souls at least 1,800 during January and February were the subjects of fever, not of a severe type, but quite sufficient to make the patients feel miserable and unfit them for work. During the presence of this fever anopheles mosquitoes were as rare as the "Dodo" in Bareilly, and although diligently searched for and relatively large rewards offered for them none were forthcoming. At this period of the year culex were swarming, and as quinine had no effect upon the course of the disease other means had to be found and employed. What checked the epidemic was burning "uplas" at night and causing a dense smoke which drove the culex away. This year test experiments were instituted, and in those rooms where "uplas" were burnt, the proportion of cases attacked were extremely small in number as compared with those which occurred in rooms where the "uplas" were not burnt.

Further in February 1903 a Gwalla, a *Pahari*, suffered at Bareilly (during the prevalence of Texas fever in cattle with hæmoglobinuria as a marked symptom) benign tertian, associated with the pyroplasma, during which serious symptoms of a remittent type of fever were developed, together with intermittent attacks of hæmoglobinuria lasting for over three weeks in all.

Symptoms in man.—The disease appears to come on in an insidious manner; a patient in apparently good health, within a period of some months, may present a sodden and pasty condition of the skin and an appearance of marked anæmia and cachexia. In ordinary cases the patient complains of headache, frequently hemicrania, the temperature is sometimes normal or subnormal in the morning, while in the evening it may rise to 99° or 100° F. as a maximum, a general feeling of malaise and sweating on the slightest exertion. At times some yellowness of the conjunctivæ may be noted, while the urine in severe cases exhibits on occasions a smoke tint, and red corpuscles are found on microscopical examination or hæmoglobinuria alone is present. In advanced cases granular and hyaline casts have been observed. In the cases which have come under observation the spleen and liver have been found to be normal in size, or only very slightly exceeding the normal proportions. Further no pigmentation of the skin of the cheeks or extremities has been noted, and the organisms invading the red corpuscles of the blood are devoid of pigment. One marked feature the temperature charts exhibit, is the presence of undulating curves at intervals with normal or subnormal temperatures intervening.

Symptoms in animals.—The great majority of mammals in this country must possess more or less protection against this form or forms of pyroplasmosis, for up to the present no animals have been obtained either in Bareilly or from other districts in whose blood pyroplasmata in some form or another have been found absent. It is somewhat difficult to say what stages, if any, the animal passes through in the first instance, if born free from the parasite.

When apparently healthy animals have their temperatures taken and recorded morning and evening, but slight variations are noted, whereas bovines injected subcutaneously with acute rinderpest serum, or with virulent rinderpest blood, may either develop a severe form of pyroplasmosis and in course of time succumb, or in the event of a modified form occurring, the temperature curve shows undulations at intervals with no other symptoms. Equines presenting pyroplasmata in their blood for long periods may show no variations from the normal temperature, then suddenly an undulating curve lasting from 5 to 8 days is observed, even when horses and donkeys with pyroplasmata in small numbers in their circulations are inoculated with either the bovine or the *Surra* Trypanosoma respectively. The former organism would appear to produce but a slight effect on the health of the inoculated animal, certainly during the course of the concurrent diseases, symptoms may become manifest, and it is at times most difficult to know to which

parasite the changes are referable. In European breeds of fowls introduced into this country, the pyroplasma would appear to bring about attacks of marked fever, for during the period of the greatest invasion of the organism the following symptoms are present:—anorexia, head hanging down, drowsiness, comb purplish in colour instead of bright red as in health, drooping of the feathers, malaise and general indisposition.

Lizard (Common Indian variety.)—During the cold season and later the blood of lizards caught in the bungalow were found to be free from the pyroplasma, but when the mosquitoes appeared in large numbers, lizards caught on the verandah outside the house presented the organism in their circulations, and after the mosquitoes had entered the building the blood of the lizards caught inside the building were also found to be invaded.

Inoculation of a lizard whose blood was free from the parasite.—The larva of an infected culex fatigans in which both micro- and macro-gametes were present in large numbers, was mashed up and triturated in sterile distilled water, and five minims of the mixed fluid injected subcutaneously into a lizard free from the parasite. In *24 hours* after inoculation, the red corpuscles were found to be free from microgametes. The female cells were either replete with elements or had already evacuated their contents. Cells containing the male elements, and others, the walls of which had given way, were observed. The latter exhibited masses of gelatinous material from which the dumb-belled bodies were wriggling and liberating themselves in the plasma.

In *48 hours* some red corpuscles contained the elements of one sex only, while others exhibited both male and female elements. Further several cells containing very small pyroplasmata were noted in an early stage of development. The different stages observed in the latter were: (i) two small black dots surrounded by a halo; (ii) the dots lying rather further apart; (iii) dots slightly turned upwards; (iv) semi-lunar in form with enlarged ends; (v) still larger in size; (vi) the pyroplasma in pairs connected probably by their bases.

In *72 hours* the pyroplasmata had become developed within the red cells, while large numbers of others were seen free in the plasma. The female elements in the red corpuscles had increased in size. Male and female elements were free in the plasma, and present in the cells in considerable numbers.

During the second cycle of 72 hours, between the 4th and 6th days inclusive in stained specimens (Modified Romanowsky's method), in addition to the changes noted above certain others were observed. (*a*) Small bodies invaded the red corpuscles between the nucleus and its outer margin; they stained a reddish-purple in colour and gradually increased in dimensions until they ruptured the red corpuscles in which they were situated, they then developed what appeared to be vacuoles in their interiors, and later the contents of the cells escaped, but the mother cell still maintained its position in proximity to the red corpuscle, although a slight space between the cell and the red corpuscle could be detected. The liberated elements appeared to be micro-gametes. (*b*) Other red corpuscles were invaded by cells which stained a purplish red, which, when mature, presented somewhat the appearance of mulberries. It was considered probable that these cells contained micro-gametes. (*c*) A third form of cell developed within the red corpuscles; these stained a dark red, were somewhat circular in the first instance, but later increased and assumed irregular forms, more or less globular; before leaving the red corpuscles and escaping into the blood plasma they developed vacuoles in their interiors, which at first could be only just made out, but which later increased in size until they became a marked feature. (*d*) Large mononuclear lymphocytes, with nucleus stained purple and body of cell a light blue, contained numerous bright red-coloured bodies in their interiors, the greater number in the protoplasm of the cell, although a few were observed in the interior of the nucleus. These red-coloured elements resemble micro- and macro- gametes, for some are circular, while others present dumb-bell forms. These elements would appear to have been taken up as foreign bodies, the cell for some reason having taken on the duties of a phagocyte.

Mosquitoes and Ticks.—The gametes are of two sexes: the male element, or microgamete, appears to consist of a dumb-bell shaped body, supplied with cilia, for when two male elements come together, the extremities do not come into opposition, but appear to be separated by a kind of halo, which surrounds the extremities. It is endowed with movement, twisting, and twirling. When in the horizontal plane it presents two beaded extremities, with a short connecting rod, whereas when in the perpendicular plane but one globular extremity is visible, and can be seen as a black speck. The female element, or macrogamete, presents a circular form, is translucent, and considerably larger than the male. No nucleus or other structure can be observed. In fresh specimens the body is endowed with movement, and therefore probably possesses cilia also.

When the male and female elements are free *in vitro*, prolonged observation under the microscope will reveal the male, executing a series of movements round the female, evidently with view to discover a means of entrance in the female element. The search may occupy in some instances a considerable period exceeding an hour, in others, but a few minutes. When the object of the search has been discovered the male makes a sudden dart and would appear to enter the female by means of an existing

duct or passage, for instantly the male is seen within the female element and as suddenly all movement ceases, and the male element becomes stationary. In this way the zygote is formed. From this point the description must diverge according to the changes which have been observed in the zygote, whether for the development of the micro- or macro- gamete.

Macrogamete.—A small body is observed in the lower segment of the zygote somewhat semilunar in form, but with rounded extremities; this body gradually increases in length and general dimensions, until it occupies $\frac{1}{2}$, $\frac{3}{4}$ and $\frac{7}{8}$ of the circumference of the cell, the centre remaining free. At this period of the developmental stage certain bodies, somewhat circular in form, are first observed in the annular body, which later become well defined and complete the ring, while still the centre remains free. Still later the small circular bodies become free within the cell and occupy all parts of it, including the central portion. The cell now distended, gives way, and the contained bodies leave the cell in a mass of gelatinous material, and free themselves in the plasma. These are the macrogametes.

Microgametes.—The development of the male elements from the zygote would appear somewhat analogous to that of the macrogamete. As the zygote increases in size it appears to contain a small central mass, surrounded by clear protoplasm, while a narrow band round the inside of the circumference of the cell contains a very fine granular material. As development proceeds the central mass gradually increases in size, until it presses and encroaches upon the external ring containing the fine granular material. At this period the central mass appears to be made up of short bodies endowed with movement. When mature the cell bursts and sets free dumb-bell shaped elements which are at first entangled in a gelatinous mass, wriggling hither and thither until they liberate themselves and become free in the plasma.

Ticks.—The mode of development of the parasite in the tick appears to be analogous to that in the mosquito. A female tick, distended with blood, was removed from the ear of a pariah dog, and allowed to remain in a small sterile bottle for a number of weeks, until it had become quite dry, shrivelled and dead. On dissection, and when a small drop of sterile water was placed upon the internal organs, left for half an hour, well covered, and subsequently examined microscopically it then exhibited the presence of innumerable micro- and macrogametes. Further ticks taken from Hill bovines in January 1903, which latter had been brought from the mountains across the Bhibar and Terai in December 1903, deposited eggs in sterile test-tubes. The eggs after a period of over 60 days, when crushed and triturated in sterile salt solution and left for some minutes, also revealed the presence, on microscopica examination, of micro- and macro- gametes in some numbers.

In man.—In mammals, including man, the development of the pyroplasma is of the asexual variety. Both male and female elements enter the red corpuscles, the after changes being more or less of the same character. The female cell, presents, in the early stage of development, a small curved body in its lower segment, which by successive stages, extends and occupies some $\frac{7}{8}$ths of the circumference of the cell. Ultimately the annular body forms a complete ring and presents a number of circular bodies situated in regular order round the circumference of the cell; when mature the mother cell bursts and liberates a protoplasmic mass, containing small cells circular in form. As each individual cell leaves the mass an excavature, or bay, is left in it, corresponding to the size of the cell just released. Further, each of the liberated round cells commences to develop and gradually increase in size until they become fully matured, burst and set free small round transparent cells, which are the macrogametes.

Shortly after the male element obtains an entrance into the red corpuscle, the terminal enlargements grow further apart so that the connecting bar between the dumb-bell is lengthened. The poles then exhibit indications of turning up, this condition gradually increases until fully developed pyroplasmata are formed. Next the pyroplasma becomes liberated from the blood cell, and later the nucleus, or karyosome, is shed by the mature parasite. It is conjectured that the karyosomes, when free in the plasma, gradually increase in dimensions until when ripe, they in their turn, burst and set free the microgametes.

In the lizard it would appear that both forms of development, *viz.*, the sexual and asexual, proceed concurrently, while in mosquitoes the sexual form is present, and in man and in warm-blooded animals the asexual only.

This preliminary statement of the investigations, as observed up to the present, is simply being put on record, as one of us is proceeding on leave.

The observers, however, reserve to themselves the right of adding to, or withdrawing, any views which have been expressed, and which may later be found to bear a different interpretation when further researches have been concluded. It is thoroughly recognised that only the threshold of this enquiry has been entered and that much remains to be confirmed of what has been observed, whilst innumerable new facts remain untouched. The unification, or differentiation, of the organism observed in various animals must engage attention in the near future, while questions with regard to the symptoms produced by the pyroplasma in man in different parts of this country are of primary importance, with a view to determine if diseases like *kala-azar* and other cachexias, the intimate etiology

A PRELIMINARY NOTE ON A PYROPLASMOSIS FOUND IN MAN AND IN SOME OF THE LOWER ANIMALS.

By A. LINGARD, M.B.,
Imperial Bacteriologist to the Government of India; and
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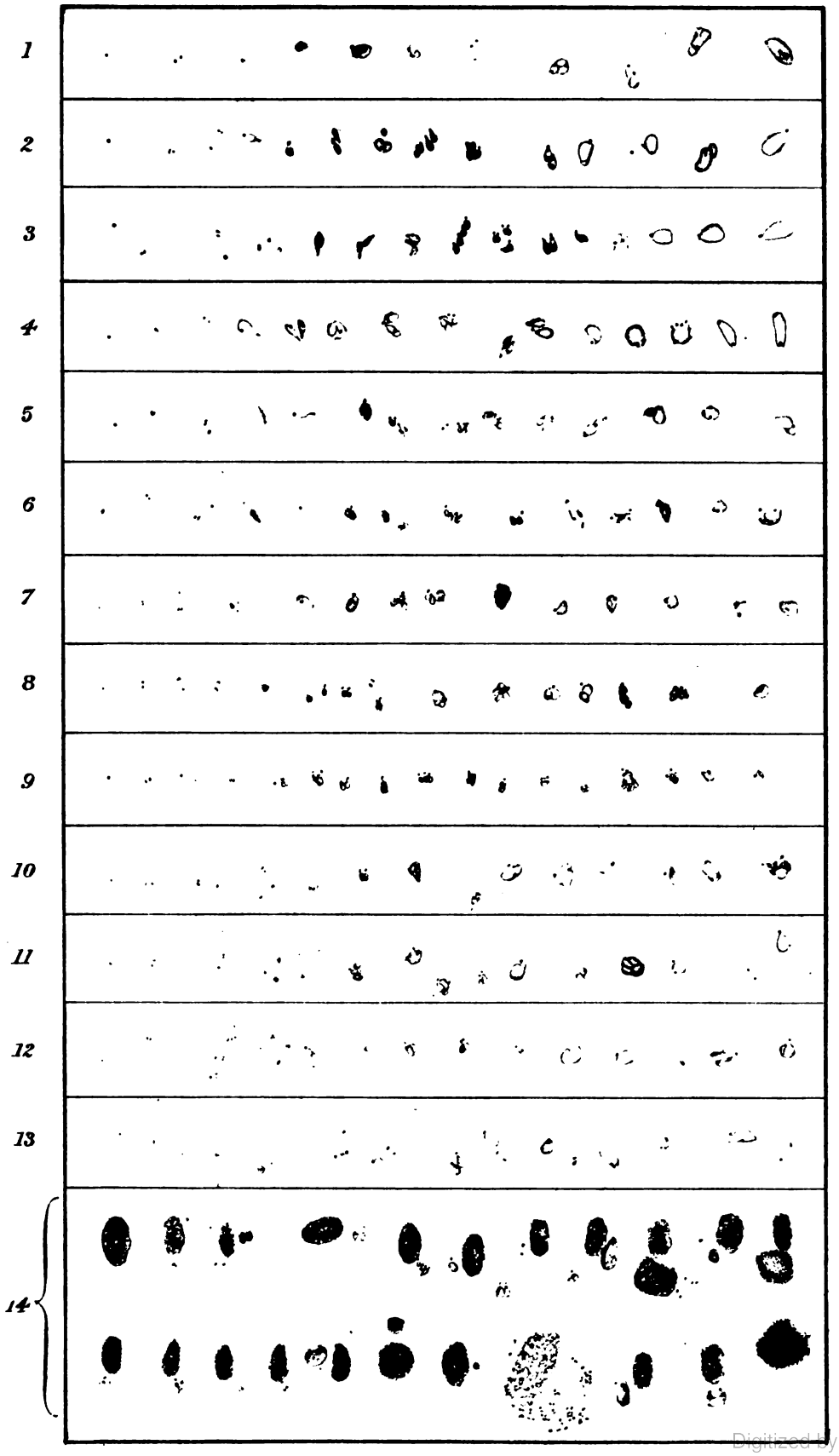

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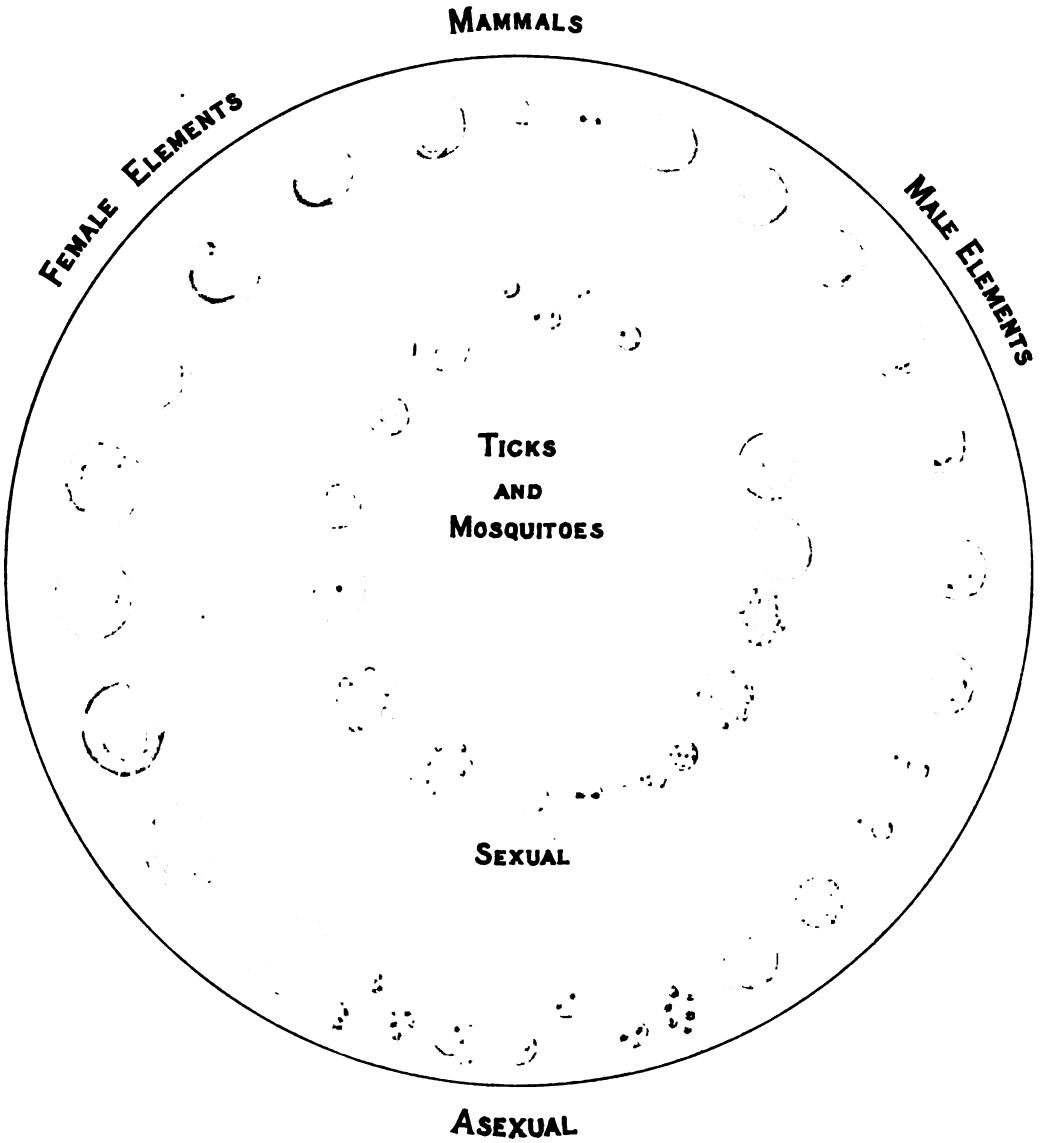

of which are now but little understood, may not be in some way connected with this or some modified organism belonging to the same genus.

EXPLANATION OF ILLUSTRATIONS.

Magnification of all red corpuscles 1000 *diameters.*

Plate I.—Red blood corpuscles of various animals showing the early and mature forms of pyroplasmata within the cells.

No. 1. Human red blood corpuscles, 2. Pony. 3. Donkey. 4. Plains bovine. 5. Hills bovine. 6. Buffalo. 7. Camel. 8. Goat. 9. Kid. 10. Dog. 11. Guinea-pig. 12. Monkey. 13. Elephant. 14. The lizard.

The first corpuscles in each line respectively, show the male elements in the red corpuscles, depicted as small dots, one pole only observed, surrounded in each instance by a halo.

The second corpuscles showing two small dots, with a connecting bar between, which is more or less invisible, the horizontal position of the former also presenting a halo.

The fifth corpuscle of No. 4, Plains bovine, depicts what appears to be the veritable pyroplasma bigemnium.

The fourth corpuscle of No. 5, Hill bovine, shows the bacillary form of the pyroplasma, so frequently observed in the blood of plains cattle in these provinces.

In the other corpuscles of various animals depicted, it will be observed that the pyroplasmata have taken a blue stain with the karyosome or nucleus red in the early stages of development, but as the organisms attain larger proportions or are more advanced in age and development, but a faint blue colour is retained, although in most instance the karyosome stains red.

In the red corpuscles of the lizard, different forms of organism have been depicted, both developmental and mature forms of the pyroplasma.

Microgametocytes—7 and 6 of line 2 and 11 10 of line 1.

Macrogametocytes—11 of line 2, with red elements.

JAIL STOMATITIS.

BY NOBIN CHUNDER DUTT,

Civil Surgeon, Palamau.

NEXT to dysentery one of the most prevalent diseases in some Bengal jails is a kind of ulcer affecting the gums, mouth, tongue and the fauces. This has, for many years, been regarded as scurvy or a disease of scorbutic origin. Major W. J. Buchanan in his excellent little book on *Jail Hygiene*, after describing its appearances says: "The present writer, however, in common with nearly all medical officers in Bengal who have commented upon these appearances does not believe that they have any connection with scurvy, but they are due to malaria," and he has given the following reasons for this opinion:—

1. The appearance of the symptoms coincides with the most malarious portion of the year (*i.e.*, end of the rainy season).
2. Frequent history of repeated attacks of malarial fever.
3. In malarious years this condition is frequent.
4. In jails, where undoubtedly a good and sufficient quantity of fresh vegetables has been issued, and in which fresh meat was also frequently given, the condition has appeared in malarious years.
5. Failure of lime juice treatment to remove this condition.
6. Absence of effusion and ecchymosis of blood.

That the disease is not scurvy or of scorbutic origin is now settled; but what is it, and is it entirely due to malaria?

I venture to submit to the readers of the *Indian Medical Gazette* the following facts which have come to my notice during the last two years during which I have studied this disease as it presented itself to me in the Daltonganj Jail for whatever they are worth.

This disease has been of yearly occurrence in this jail from the very beginning of its existence. Except a few of the most aggravated cases which were treated in hospital no records of any others had unfortunately been kept during the past years. I took over charge of the jail about the middle of September 1901 with a legacy from my predecessor, of a somewhat large number of these cases* in various degrees of development amongst a jail population of 115 of all classes. A careful record was however kept during the years 1902 and 1903. The first case in 1902 appeared on the 16th of June, 65 others quickly followed—39 amongst the convicts, and 27 among the under-trials. By the middle of October they had all been cured, and no new cases occurred during the remaining portion of the year. Of all the diseases in the surgical nosology this bore the closest resemblance to what is known as stomatitis in almost all its different varieties, namely, herpetic, aphthous, ulcerative and even mercurial, except the grangrenous, which is generally known to us as cancrum oris, and is, I believe, exclusively of a malarial origin, being almost invariably found co-existent with an enlarged spleen and an extremely debilitated and shattered constitution. Some of the cases in the Daltonganj Jail began as herpetic or aphthous variety and developed into the condition bearing every resemblance to the mercurial, with foul breath, swollen tongue, spongy gums, salivation, swelling of the parotid and submaxillary glands and loosening of the teeth.

* The exact number unfortunately cannot be given, but if I mistake not nearly one-third of the jail population.

Stomatitis of the herpetic variety is described in surgical books as "generally of dyspeptic origin." "In old people," it is said, "it may be gouty." Ulcerative stomatitis, it is said, "may depend upon digestive disturbance, local irritation or bad hygiene" (*vide* Walsham's *Theory and Practice of Surgery*). The most common varieties to be met with in the jails, as far as my experience goes, are the herpetic and the ulcerative.

There can be no doubt that in Bengal malaria plays a most prominent part in almost every diseased condition of the body, and that it should be one of the chief factors in the production of jail stomatitis or its predisposing cause, there is not the slightest reason to question, but is it the only cause, or can jail stomatitis occur independently of malaria is the question to which I wish to draw the attention of the Medical Officers in charge of Jails.

The District of Palamau, except in a few remote and limited areas, is not a malarious district in the same sense as is Lower Bengal. Of the 66 cases of jail stomatitis which came under my observation during the year 1902 only seven could be traced to rural areas from which a comparatively large number of deaths from fever was reported during the year, and ten cases had history of occasional fever before admission into jail,—none of them had enlargement of spleen or any other signs indicative of malarial cachexia; none of them ever suffered from stomatitis before admission into jail, and the shortest time within which a man was affected after his admission into jail was 13 days and the longest 92 days. These 66 cases were treated in the following manner:—

1. Milky juice of the rind of the papaya fruit was applied locally. In very bad and sloughing ulcers nitrate of silver lotion—20 grains to the ounce—and a gargle of permanganate of potash was also used.
2. Papaya pulp dried and made into a fine powder, was used internally in ½ to 1 drachm doses twice daily after the principal meals.
3. Chutnies and acids of all kinds in the diet were stopped, and one or two green chillies substituted instead.
4. Green papaya fruit was given as curry.
5. Meat and dahi alternately, twice a week, were given to the more weakly prisoners as a preventive.

During the year 1903 only one case, which was of the ulcerative variety, occurred. This was a case of recurrence in a man who has been in jail since 18th November, 1902, and who who suffered from the disease in a very aggravated form during that year. He was treated with nitrate of silver lotion and a gargle of potash permanganas only. No medicine was administered internally, and no animal food was given except *dahi*. He recovered quickly. This case occurred on 28th July 1903.

From January to September of the year 1902, and during the hot months only of the year 1903, namely, March, April, June, and a portion of July, tamarind, roselle and pickles of lime and mango were issued to the prisoners with both the principal meals. Immediately on the occurrence of the first case on the 28th July all articles of food of an acid kind were stopped, and in their place one or two green chillies were issued to each prisoner, and two chittacks of potatoes in the form of *bhurta* and boiled onions were issued alternately every day as an extra ration to the weakly (special gang) prisoners, of whom on no particular day there were more than 11, in addition to *dahi* which was given them daily as a rule. No meat was given in any case. In fact, except for *dahi*, all the prisoners out of hospital have been practically vegetarians during the year 1903. Chicken soup and meat were used for special cases in hospital. With the exception of this solitary case, no other case of stomatitis has occurred in this jail during the year 1903.

In my article on "Unaccustomed Plenty and Prevalence of Bowel Complaints in the Bengal Jails," published in the May 1903 number of the *Indian Medical Gazette*, I mentioned that I had an idea that ulceration of gums—more correctly ulcerative stomatitis—so common in Bengal jails, was a disease which was connected with a vitiated condition of the digestive organs and probably originated from the same or similar cause as jail dysentery, and that I had sometimes thought that an acid condition of the blood and of the mucous secretions due to malassimilation of food might be the cause, and also that this received some confirmation in the result of the treatment which I adopted. My observations during the year 1903 goes far to confirm this idea. That stomatitis may be due to indigestion is admitted. In the present instance, that is to say, in the instance of jail stomatitis, I believe indigestion forms a considerable factor, if not the chief cause, and that it is of the acid fermentative kind which gives rise to the formation of an acrid, substance which irritates and inflames the mucous membrane of the mouth and fauces, causes sponginess and wearing off of the gums and denudation of the epithelium of the tongue. The acid product may be butyric, lactic or acetic, or a mixture of all. Perhaps a chemical analysis of the saliva and the gastric secretions may throw some light upon the subject. Cannot this indigestion be due to unaccustomed or unsuitable food? Cannot acid food, such as pickles of different kinds, tamarind, roselle, to which the prisoners were not accustomed at their homes, produce, predispose to or aggravate this condition?

The following quotations from the Administration Report of the Jails of Bengal for the

year 1894 by Lieutenant-Colonel Comins is significant:—"An increase in the ration of vegetable acids and vegetables has often little or no effect on this state, whereas the too marked acidity of the food is distasteful to the prisoners, and the appetite for their food is lessened. It is stated that a connexion can be traced between increased ration of vegetable acids and tendency to indigestion, diarrhœa and even dysentery." I should now add stomatitis also.

My observations during the present year have brought the following facts to light:—

1. That stomatitis in the jails may occur even in persons without any malarial taint in their systems.
2. That it is intimately connected with indigestion, particularly of an acid fermentative kind.
3. That neither fresh vegetables in excess nor meat diet is called for to rectify the condition which produces it.
4. That it can be effectually prevented by carefully eliminating the acid element from the food of the prisoners during the months of June, July and August, and by general improvement of the digestive function by the use of stomachics and digestives, of which capsicum and papaya are the handiest and most easily procurable.
5. That this disease in this district at any rate is entirely confined to the jail. I have vainly looked for it outside among the dispensary patients and the general population in the town as well as in the district.
6. That it occurs only during the rainy months of the year, namely, June, July, August and September, seldom occurring before and disappearing as soon as the cold weather sets in.
7. That it has a strange connection with dysentery incidence in the jail, both these diseases showing a tendency to increase and decrease in an inverse ratio to each other every month, as the following statement will show:—

Months of the year.	Number of dysentery cases.	Number of cases of ulceration of mouth.
January	...	...
February	...	.
March	4	...
April	2	...
May	5	...
June	8	23
July	12	12
August	8	23
September	4	1
October	...	7
November	2	...
December	3	...

In conclusion, it seems to me quite possible that jail dysentery and jail stomatitis may arise from one and the same cause, namely, irritation of the mucous membrane of the alimentary canal by an acrid acid substance, the product of fermentative dyspepsia due indirectly to unaccustomed food and directly to excess of the acid element in the same, the result of this irritation manifesting itself as stomatitis in the mouth and as dysentery in the bowels.*

THE CULTIVATION OF THE BACILLUS LEPRÆ.

BY E. R. ROST,

CAPTAIN, I.M.S.,

Resident Medical Officer, General Hospital, Rangoon.

JUST as there is a class of bacteria which may be classified as anærobic, so is there a class of bacteria which may be classified as a-chloretic.

This class of bacteria is the acid-fast group, of which B. Tuberculosis, B. Lepræ, and B. of Lustgarten are pathogenic.

This conclusion was arrived at after extensive experiments based on a certain law of the periodicity of the pathogenic organisms, which has, however, not yet been published, but which is based on the law of the periodicity of the atomic weights of Mendeleif.

I showed this theory to some authorities when in England last June, but it was thought to be rather far fetched, it was not until returning to Burma last August that I commenced to practically investigate the truth of the theory, and this led to the cultivation of the acid-fast series and the manufacture of a leprolin on the lines of Koch's tuberculin, which has given very encouraging results when injected into lepers.

Although these experiments are far from being completed, I hasten to lay before you the facts as far as I have yet gone, as the importance of the discovery justifies its being universally known as soon as possible in order that those more competent than myself may further investigate the subject, for the benefit of those unfortunate beings affected with the terrible disease leprosy.

In this account I will refrain from theorizing, and will therefore not mention anything about this law of the periodicity of pathogenic organisms. Believing that the acid-fast series of Bacteria would not grow in the presence of salts of chlorine, I tried to extract the chlorides out of nutrient media, and this was first done by

* We commend this paper to the attention of Civil Surgeons in charge of Jails. This question of spongy gums is often coming up, and in many places these cases are regarded as scurvy or "incipient" scurvy. We invite discussion.—ED., *I. M. G.*

making a medium from distilling beef extract which gave a clear fluid, which smelt strongly of beef. In this medium it was found that the B. Tuberculosis grew with great rapidity, and this led me to try to grow the B. Lepræ and the B. of Lustgarten in this medium. The leprosy bacillus was obtained from the fresh granulating sores of a case of leprosy, and that of Lustgarten from underneath a primary syphilitic sore, both these cultivations appeared on the second day, as white, stringy, streaky, heavy, deposits at the bottom of the tubes, which were difficult to shake up, but when shaken up formed a curly white, stringy filament in the tube. This on microscopic examination was found to give all the characteristic appearances of the Bacillus Lepræ, and was very resistant to acid, more so than the Bacillus of Tubercle.

They appeared as small beady bacilli of irregular size, which in fresh specimens were motile, they were straight and some had thicker ends than others, the beads appeared to be spores, as sometimes only the small round red stained balls were to be seen, and at other times the small spores as well as the bacilli, they grew in groups and sometimes were so massed together as to appear as a red mass. At times they appeared in long threads, like the tubercle bacillus appears sometimes in culture.

Numerous attempts to grow the bacillus in solid media, evidently due to the large amount of salts in agar, led me to adopt a further method of preparing the medium, and this was done by dialysis. By dialysing the nutrient agar through an animal membrane in hot distilled water for some days, I obtained a medium which was entirely free from salts, and in this I have grown the bacillus with the greatest ease. The bacillus of leprosy grows on the surface of solid media as a white or very slightly yellow beady growth, and the growth appears after two days' incubation at 37C. like with the liquid medium. The bacillus had the same characteristics in the stained preparations taken from these cultures.

In dialysed beef broth or dialysed fish broth the bacillus grew also with the greatest ease, as did also the Bacillus of Lustgarten and the Tubercle Bacillus.

The appearance of the cultures of these three organisms is very similar, but the cultivations of leprosy were not so easily shaken up from the bottom of the tubes as the cultivations of tubercle, and those of the Bacillus of Lustgarten appeared to stick firmer than the others to the bottom of the tubes.

It was moreover found that glycerine is not at all necessary for the growth of these bacteria, and that in the case of leprosy it appears to prevent the growth altogether, moreover the specimens taken for observation are very hard to dry if there is any glycerine present.

It was found that the salts of iodine and bromine did not inhibit these bacteria, even when in as large amount as 10 per cent., and the iodine and bromine became precipitated after some days in the tubes. But there appeared to be some choice for these halogens between these bacteria, for it was found that the B. Tuberculosis preferred the bromine salts and the B. Lepræ the iodine salts, though they did not grow in this media with the rapidity with which they grew in the plain media.

Over three hundred cultivations have been made of these bacteria in these media, and in no case has there been any reason to doubt that the organisms cultivated were not the B. Lepræ, the B. Tuberculosis, and the B. of Lustgarten, the cultivations of leprosy were obtained from several different cases of leprosy, after finding the bacillus in the granulations.

It was further found that the bacillus of leprosy sediments to 1 in 40 dilution with distilled water with the serum of cases of leprosy.

The next thing that was attempted was the manufacture of a leprolin on the lines of the manufacture of tuberculin laid down by Professor Koch.

Cultivations of leprosy in the distilled beef extract, which was further improved by the passage of superheated steam over the boiling extract, were allowed to grow at a temperature of 37C. for six weeks, and then sterilised and passed through a Pasteur filter, and then glycerine added to the clear fluid. The injection of this into cases of leprosy has given very encouraging results, though it is too early yet to say with what benefit, the action of the leprolin is so marked that I am not waiting to see what is going to happen before publishing observations that I am now making, as it is necessary that others should try what has already been attained before going deeper into these experiments.

THE EFFECT OF THE INJECTION OF LEPROLIN INTO LEPERS.

Eleven cases of leprosy have now been injected with the material, the manufacture of which has been described above, and the action in these cases has been so marked and in some cases the improvement so obvious that it appears that there is something in this material, and certainly that its action is very similar to that of tuberculin in cases of tuberculosis.

The first case, a Chinaman, with anæsthetic leprosy and markings on the face and tubercles in the ears, was injected with 5 c. c. of the leprolin intra-muscularly in the buttock, there was only a slight reaction, the temperature rising to 99 F. and the pulse to 112, but the anæsthetic patches became slightly red and hot, and the patient said that he felt hot and light all over. The next day an injection of 20 c.c. was given in the other buttock, and the effect of this was almost instantaneous, as the pulse

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By E. R. ROST, Captain, I.M.S.,
Resident Medical Officer, General Hospital, Rangoon.

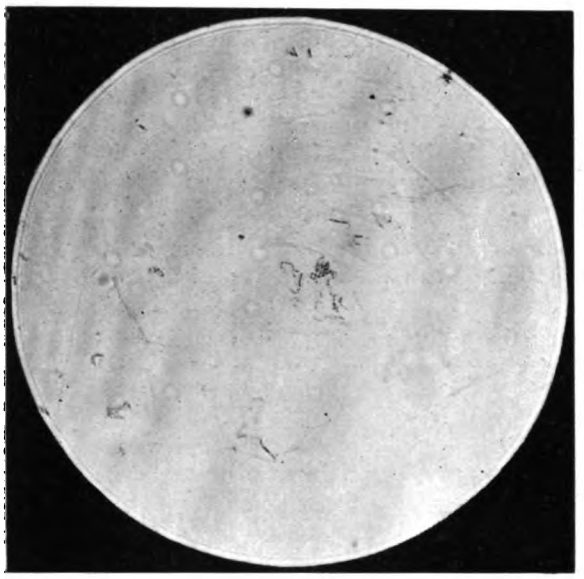


Fig. 1.—Micro-photograph of Stained Specimen of the Bacillus of Leprosy? From a Culture in the Liquid Medium.

Oil immersion 1/12 in.

(Shows the beady appearance of the bacilli.)

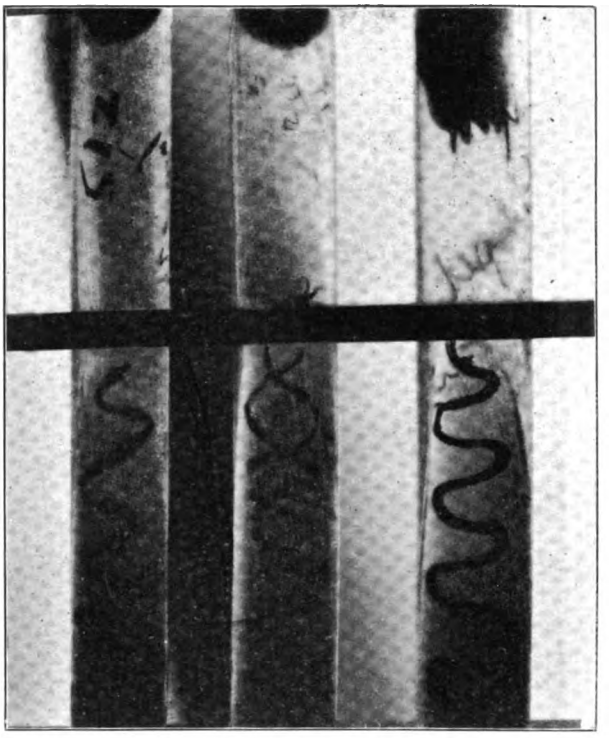


Fig. 3.—Photograph of Cultures of the Leprosy Bacillus on solid Medium? Made from Dialysed Fish Extract Agar.

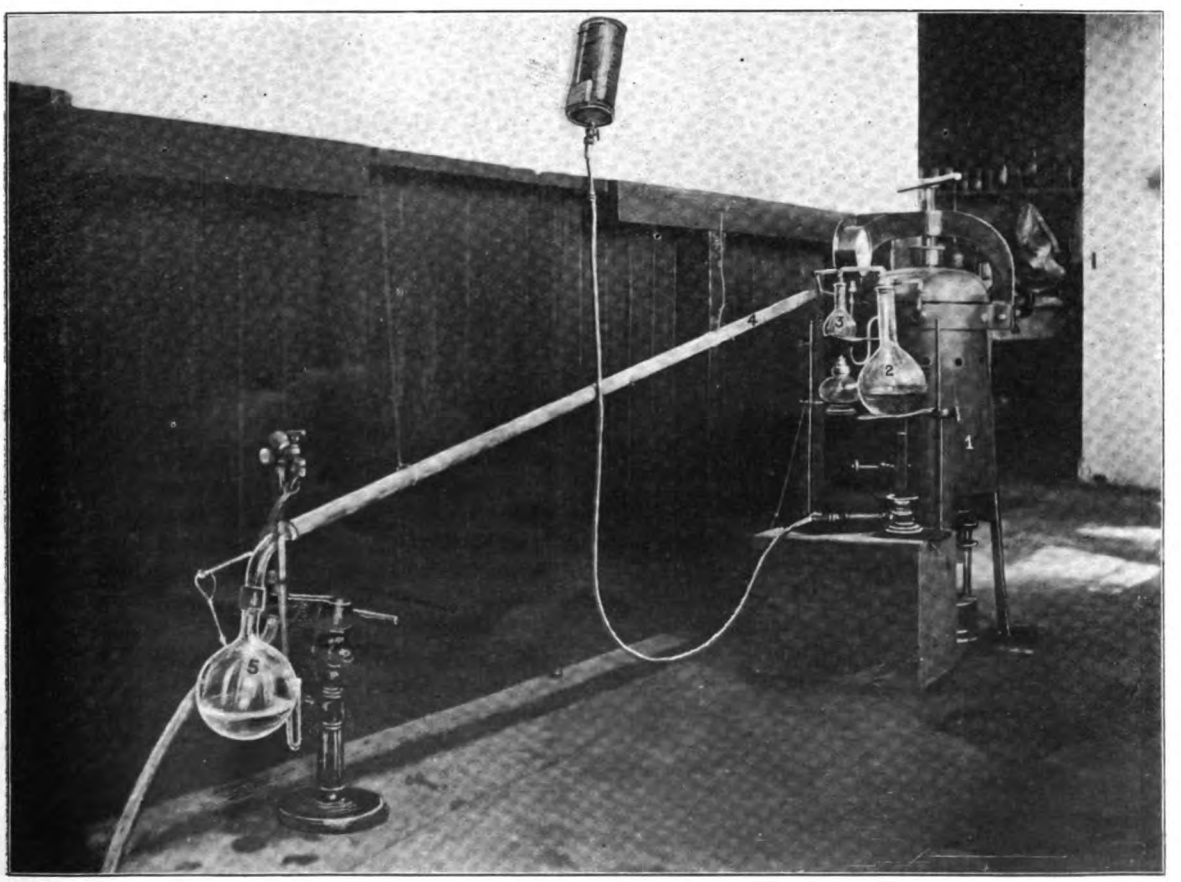


Fig. 2.—Photograph of the Apparatus prepared for the Manufacture of the Liquid Distilled Medium.

(1. Autoclave. 2. Flask in which the beef extract is being boiled. 3. Catch flask, in case any boiling over occurs. 4. Condensing tube. 5. Flask for catching the medium, sterilized before.)

immediately rose to 110, the anæsthetic patches became red and hot, the breathing rapid, and the temperature rose to 101 F. The next day the sensation on the patches on the cheeks returned, the redness subsided, and the temperature fell between 100 and 99 F., and the pulse and respiration to normal.

Ten days after this another injection was given of the same amount, with similar results, the temperature going up to 100·5 four hours after, and the redness of the patches appearing only five minutes after the injection, it is now 20 days since he was first injected, and the nodules in the ears have become much less evident, the patches of anæsthesia on the face have almost disappeared, and there is now some slight sensation in the legs, whereas there was none whatever before. The patient has also been taking salt and applying salt ointment to the body, and the salt ointment should be applied when the patches are red and swollen after the injection, as it is at this time that the action of the salt on the bacteria is likely to take effect.

Ten other cases have been injected mostly at the Leper Asylum at Kemmendine, cases in all stages of the disease, and the reaction in nearly all these cases has been the same as that described above. The sensation returned in portions of the anæsthetic patches in some of these cases, one case showed signs of the breaking down of a nodule, which gave out some sanious fluid the day after, but which dried up again. In two cases there was no reaction noticeable after the injection; these cases had no ulceration and were early cases of the disease, and one case stated that he did not notice anything after the injection. The other cases said that they felt lighter in their legs and better after the injection, and certainly there has been a return of sensation most marked in some cases. A second injection has just been given to these cases, which, as before, was followed by a sharp rise of temperature to between 103 and 105, the injection was, as before, given in the buttock, and 20 c.c. of leprolin freshly prepared and from a somewhat better culture than before. There was a good deal of local swelling and redness of the affected parts, and the same symptoms as mentioned above.

These cases cannot be published in full until their after-history is known, I merely briefly state the symptoms to show that the action of this material is similar to that of tuberculin in consumption.

That the material injected was actually the toxins from cultivations of the leprosy bacillus there can appear little doubt, and that this material has an action in the disease, there can also be little doubt, but whether this action is beneficial or not time can alone show.

I shall be glad to forward cultures of the bacillus, or the leprolin, to anyone who would like to try its action.

"A CONTRIBUTION TO THE STUDY OF THE ACTION OF INDIAN COBRA POISON."*

BY CAPTAIN R. H. ELLIOT, M.B., B.S., LOND., F.R.C.S., ENG., D.P.H., CAMB., ETC., *Indian Medical Service* (*Madras*).

ON special duty for Snake Venom Research, under the orders of the Secretary of State for India. Communicated by Professor Sir THOMAS R. FRASER, F.R.S., Received January 18,—*Read* February 25, 1904.**

(Abstract.)

Previous Work on the Subject.

Brunton and Fayrer† discussed the pharmacology of cobra venom at some length; they attributed the effects of the poison to its action on the cerebro-spinal nerve-centres, especially on the respiratory centre. They observed that cobra venom had a direct action on cardiac muscle, and that it also affected the heart through the vagal system, but they did not lay much stress on circulatory failure. They surmised that the high and maintained blood-pressure of a cobraised animal was due to arteriolar constriction, but did not attempt to explain how this was brought about. Amongst the many other points of interest they took up, was the influence of artificial respiration in cobraism.

Cunningham in the 'Scientific Memoirs by Medical Officers of the Army in India'‡ urged the opposing theory that cobra venom acted on respiration through the blood and not through the nervous system.

Weir Mitchell and Reichert§ carried on Brunton and Fayrer's views. Their paper was mainly concerned with the venoms of other snakes than the cobra. They thought two factors were at work on the rate of the heart, *viz.*, an increased activity of the accelerator centres, quickening the beat, and a direct action on the heart slowing it. They attributed the primary fall in blood-pressure to depression of the vaso-motor centres, but thought it might be partly cardiac. The rise they considered "capillary" and the final fall cardiac.

Bagotzi‖ laid great stress on the *rôle* played by nerve-end paralyses (especially phrenic), and disputed Brunton's views that respiration was attacked through the medullary centre. He

* Read before the Royal Society, and sent by the Society for publication.

** Owing to the kindness of Professor Sir Thomas Fraser and of Professor E. A. Schäfer, the writer was enabled to carry out this research in the Pharmacological and Physiological Laboratories of the University of Edinburgh. Towards the expense of this research, grants were received from the British Medical Association and from the Moray Fund for the Endowment of Research (Edinburgh).

† 'Roy. Soc. Proc.,' vols. 21, 22 and 23.

‡ 1895, Part IX, and 1898, Part XI.

§ 'Smithsonian Contributions to Knowledge,' 1890.

‖ Virchow's 'Archive für Path.,' vol. 122, p. 201.

did not find any action of the venom on the vagal mechanism. He surmised that death with a tightly contracted heart, the result of very large doses of venom, was due to a cardiac action.

C. J. Martin in the article on snake venom in 'Allbutt's System of Medicine,' considers that, in cobra-poisoning, the circulatory mechanism is not easily affected, and contrasts this with the state of affairs in viperine poisoning. He found that vagal stimulations stopped the heart up to near the end of life in cobra-poisoning.

Object of this Research.

This was to accurately ascertain the precise part played by the various important centres, nerves and organs in the production of death from cobraism.

Methods employed in the Research.

1. *Perfusion of the frog vessels was carried out with solutions of cobra venom of various strengths.*—The central nervous system had been destroyed first in each case.

The strength-limitation of the action of the venom on the arterioles was carefully studied.

2. *Perfusion of frog hearts was carried out with solutions of cobra venom of various strengths.*—The isolated hearts were perfused in Schäfer's plethysmograph, and blood mixture was employed as the vehicle for the poison. The strength-limitation of the action of cobra venom was again determined here. Certain drugs which resemble this poison in their action on heart muscle, were also experimented with, *e.g.*, strophanthin and the sulphate of atropia. The risks apparently attendant on the use of the latter drug in cobra poisoning are pointed out.

3. *The study of the action of cobra venom on the frog heart in situ* was next taken up, by means of a number of devices, which included the direct application of the poison to the medulla oblongata, which was exposed for the purpose.

4. *Perfusion of the mammalian heart was carried out with solution of cobra venom of various strengths.*—The isolated heart was perfused through its coronary vessels with a nutrient fluid, in which the venom was dissolved. Cats' and rabbits' hearts were used.

5. *By means of kymographic tracings, the blood-pressure, respiratory movement, etc., of cobraised rabbits were recorded and studied.*—The activity of the vaso-motor mechanism was studied, in various stages of cobraism, by stimulations of the depressor and sciatic nerves, the vagi were cut, likewise at various stages, and their ends were also stimulated, in order to ascertain the part played in cobraism by the vagal inhibitory mechanism; injections of a solution of sulphate of atropine were also made, and the effects were observed. The author received much help in this section from Drs. Sillar and Prentice.

6. *A similar set of experiments to the last was carried out on dogs and cats, plethysmographic tracings of intestinal volume were also included here, in order to study the changes, if any, going on in the splanchnic area circulation.*

7. *The movements of the auricle and ventricle were studied in cobraised cats and dogs by removing the front of the chest parietes, and attaching the auricular and ventricular walls (by means of hooks and silk threads) to levers recording on a kymographic apparatus.*—The blood-pressure in a large artery was recorded at the same time, and intestinal volume was also frequently taken by means of a plethysmograph. At various stages the vagi were divided or stimulated, and the results observed. The effect of giving further doses of cobra venom with the vagi, intact or divided, was also studied. The condition of the vagal nerve-ends received close attention.

8. *By kymographic experiments the influence of artificial respiration on the centres, nerve-ends, etc., of cobraised animal was carefully studied.*—The experiments were varied in different ways.

9. *The direct action of cobra venom on the respiratory centre of rabbits was tested by applying the poison to the exposed medulla oblongata.*—A stethograph recorded the respiratory movements, and the blood-pressure was at the same time taken on the kymograph.

10. *Several series of experiments were undertaken to ascertain the part played by the phrenic and other never-ends* in producing the respiratory complications which are seen in cobraism.

Summary of Conclusions.

1. Cobra venom acts directly on the muscular tissue of the blood vessels, or through their vaso-motor nerve-endings, constricting the arterioles, and thus raising the arterial blood-pressure. It probably affects all organs alike. In the frog vessels the action can be traced down to dilutions of 1 : 10,000,000. In a cobra-bitten man, the concentration of venom in the blood is probably at least thirty times as great as this.

2. Cobra venom also acts directly on the isolated frog ventricle, killing it in a position of firm systole, if the solution be concentrated, and stimulating it if a weaker strength be employed. The limit of the speedy lethal action on the isolated heart is reached at a concentration of about 1/500,000. The stimulating action can be traced down to a dilution of 1/10,000,000. This action of cobra venom brings it into line with the glucosides of the strophanthin group. Its action is more rapid than that of strophanthin, and is certainly not inferior to it in strength. Atropine sulphate and cobra venom, when acting in the same solution, intensify each other's action, and produce more summation of effect than one would have anticipated. This detracts from the value of the atropine salt in the treatment of cobraism, and makes it a dangerous remedy. The blood-pressure work has confirmed this view of the case.

3. Cobra venom powerfully affects the isolated mammalian heart, when solutions of it are perfused through the coronary circulation. The

action appears to be a dual one, *viz.* (1), a direct action on the muscular fibre, or on the nerve-endings, closely resembling that which is produced on the isolated frog ventricle; and (2), an action on the intra-cardiac vagal mechanism, which makes for inhibition. The result is that, in strong solutions, we find an irregular and extreme excitation of the heart, followed by early death in a position or systolic tone. If the concentration be less, the early stage of excitement yields to a prolonged phase, in which the tonic action of the poison on the heart is most pronounced: the beat is regular, steady and strong. Cobra venom interferes with the circulation through the heart in a marked manner; this is probably due (1) to a constriction of the coronary vessels brought about by the direct action of the venom on the vessel walls, and (2) to the condition of tonus into which the heart is tending to pass.

4. When given subcutaneously in low lethal doses, cobra venom kills by paralysing the respiratory centre. Such a paralysis is under these circumstances gradually evolved, and in early stages of the process, there is often evidence of a phase of stimulation preceding the paretic phase.

There is a gradually increasing venosity of the blood, and in consequence thereof all the harmful results of slow asphyxiation are produced.

If life is prolonged beyond the usual term by artificial respiration, and possibly also if the dose of venom is a very low lethal one which takes many hours to kill, the phrenic and other motor nerve-ends may become paralysed, but this is certainly not an essential feature of death from lethal doses of cobra venom, which kill within five hours. I hope to make a farther communication on this subject later.

The convulsions which precede death are purely asphyxial, and can be at once stopped by artificial aëration of the blood. Each such convulsion is followed by a phase of exhaustion of the respiratory mechanism, which is almost certainly central.

If the dose of cobra venom administered be a large one, and especially if it be given intravenously, the respiratory centre is quickly and severely affected, and respiration may cease almost at once. This cessation of breathing may be permanent, if artificial respiration be not quickly started, but if the dose be a smaller one, the rhythmic activity of the centre re-asserts itself. At first there may be a number of deep spasmodic gasps, and then the movements of respiration re-begin, very gently at the commencement, and gaining force as time goes on, till a normal rhythm is re-established, or even a stage of stimulation is manifested. Soon, however, the centre fails again, and all the phenomena of asphyxiation appear.

By applying cobra venom directly to the exposed medulla oblongata of the rabbit, I have shown that the respiratory centre can be paralysed without the phrenic nerve-ends or the heart being appreciably affected.

If very large doses of venom are injected, death may take place by cardiac failure, before the respiratory mechanism has given way. We have here to do with the direct action of the venom on the heart muscle; the beats become rapid, and shortened, and the heart passes into a systolic phase, in which it dies tightly contracted.

5. Cobra venom, when given in low lethal doses subcutaneously, raises the general blood-pressure. There may be a slight preliminary fall before the rise, but often this is wanting. In the absence of farther interference the blood-pressure remains high till very near the end of life. In the asphyxial convulsions which herald death, a farther steep rise of blood-pressure takes place; this is soon followed by a sudden and very rapid fall to death.

The high level of blood-pressure is due to—

1. The direct action of the circulating venom on the muscular tissue of the arterioles, causing a constriction of these vessels, and thus opposing a barrier to the onward flow of the blood;

2. The increased force of the heart beat as the outcome of the direct stimulating action of the venom on its muscular tissue, and

3. The stimulation of the vaso-motor centre as a result of the steadily increasing venosity of the blood.

The slight preliminary fall of blood-pressure, which is sometimes seen, is due to cardiac inhibition, but this subject will be reserved for discussion when dealing in the next section with the action of large doses of the poison.

The late fall in the rate of the heart beat is due to cardiac inhibition, the latter is due to several factors.

1. A gradually progressive asphyxiation is taking place throughout such an experiment; this affects the vagal centre in common with the rest of the nervous system; the result is a stimulation of the inhibitory mechanism, and a consequent slowing and weakening of the heart.

2. The direct stimulating action of the venom on the vagal inhibitory centre acts in the same direction as the asphyxiation of the centre.

3. There is distinct evidence that even when the influence of the vagal centres is removed, inhibition of the heart continues to progress, though in a lessened degree. The obvious inference is that the vagal nerve-ends are stimulated by the circulating venom, and probably also as a result of deficient aëration of the blood.

4. It is not improbable that a stage of exhaustion of the heart muscle follows the early stimulative action of the venom; and

5. Exhaustion of the heart is probably predisposed to by the strain put upon the organ, in having to work for a long period against an abnormally high blood-pressure.

We are now in a position to explain the sudden rapid fall of the curves of heart-beat rate and of blood-pressure, which usher in death at the close of one of these long experiments. An over-strained and weakened heart is suddenly and violently called upon to bear a farther burden, for respiration has ceased and the medullary centres are acutely asphyxiated. As a consequence there is a violent excitation of the cardio-inhibitory and vaso-motor mechanisms. The heart is slowed and at the same time has to work against a suddenly increased pressure, and it gives way. In fact we have the phenomena of asphyxiation in their entirety.

The vessels of the splanchnic area are affected *pari passu* with those of the body generally, and they in nowise act independently. The vaso-motor mechanism remains active throughout, and is, as we have seen, profoundly affected by changes in the venosity of the blood.

6. Cobra venom, when injected in large doses and especially when given intravenously, causes—

(1) a sudden fall of blood-pressure;

(2) a subsequent rise, provided the dose has not been too large; and

(3) a final fall to zero.

The early fall is undoubtedly due to inhibition of the heart. It has been clearly shown that this is mainly brought about by the direct action of the poison on the vagal centres in the medulla oblongata, as it occurs before the accompanying failure of respiration has had time to act. Moreover, it is seen whilst artificial respiration is being actively carried on, and can be checked under these circumstances by division of the vagi.

On the other hand, there can be no doubt that asphyxiation of the vago-inhibitory centre intensifies and maintains the inhibition which direct influence of the venom on the vagal centre produces.

The spontaneous recovery of respiration, of the application of artificial respiration, has a powerful influence in mitigating the action of the venom on the vagal centre. In the same way artificial respiration, and to a less extent the spontaneous recovery of respiration, appear to act beneficially on the poisoned respiratory centre.

Even if the heart is cut adrift from all central vagal impulses, whether direct or indirect, by the division of the vagi, there yet remains evidence of a continued inhibition which must be attributed to the direct action of cobra venom on the terminals of the vago-inhibitory mechanism. This action would appear to be a direct one, but there is every probability that it is indirect as well, in other words that it acts through asphyxiation of the vagal terminals, as well as by the poisoning of these parts by the circulating poison. There is, however, another factor which must not be lost sight of, *viz.*, a direct exhaustion of the heart muscle as the result of irregular over-stimulation.

2. When the secondary rise of blood-pressure, which follows the primary fall, occurs, it is due to the same factors which determine its occurrence when small doses have been injected. It remains to explain why it is sometimes absent, brief or ill marked. The explanation is simple; it is merely a question of cardiac failure. We have seen that the direct inhibitory action of the venom through the vagal centre is capable of overcoming the tendency which the blood circulating through the heart muscle has to throw that muscle into death in systolic tone. Were it not for these two rival forces to some extent equilibrating each other, cobra poison would kill by its direct action on the heart muscle. When the doses are comparatively small, or when the vagi are cut or thrown out of gear by atropine, we find the tonic cardio-muscular influence of the venom in evidence, but when the doses of venom is a large, and especially when it is intravenously given (the vagi remaining intact), the inhibitory action overpowers the muscular excitation, and failure of the heart occurs. If the inhibition is sufficiently well marked, no amount of arteriolar spasm that occurs will compensate it, consequently the blood-pressure falls.

When the dose of venom is a very large one, the direct muscular stimulation may be so intense as to overcome the maximum inhibitory impulse, and then the heart dies in systole with a quickened beat and is found after death as hard as a contracted *post-partum* uterus. Under such circumstances, any increase in the force of the heart is temporary, for the beat is probably a very partial one, the heart passes through a stage of excitement into one of increasing systolic tonus, in which the contractions are very limited in extent.

ACKNOWLEDGMENTS.

In conclusion, I desire to express my indebtedness to all who have so ungrudgingly helped me in my work. I owe my thanks to one and all, of Sir Thomas Fraser's and Professor Schafer's assistants, but especially to Drs. Sillar, Carmichael and Hering, who were always willing to aid me in any way in their power. Messrs. Burnett, Jolly and Locherby, who gave up much of their time to work regularly for me as volunteer assistants, did excellent work throughout, and I most gratefully acknowledge that, but for their aid, the work could not have been done in the time.

The help given me by Sir Thomas Fraser and by Professor Schäfer I have already acknowledged. It is not possible for me to do justice to it, or to the unvarying kindness I met with from them both.

Lastly, but far from least, my acknowledgments are due to the Secretary of State for India, to the Government of India, and to the Government of Madras, for the opportunity that has been given me to carry out this work.

HOW TO CURE ENTERIC FEVER.

By P. W. O'GORMAN, M.D., M.R.C.P., D.P.H. (Camb.), Major, I.M.S.

There is a world of difference between *curing* and "treating." Our schools and text-books teach us how to "treat." I hope to show how to abort a threatened attack and to radically cure one that is on. The Profession generally believe and insist that "Typhoid," like small-pox or the measles, "*must run its course*," and all that the physician can do is, like Jennie in the Scotch song, to "wait till the clouds roll by,"—to merely control the fever and treat symptoms as they arise. A few more advanced may directly endeavour to prevent complications, but their methods, often unpleasant and laborious, are all at variance and their results not always encouraging. Osler lays down the mortality as 5 to 12 per cent. in private practice and 7 to 20 in hospital practice. Since the introduction of Brand's hydrotherapy, the deaths in institutions have been reduced to 5 or 6 per cent., although in Osler's own wards to 7 per cent. The N. Y. Metropolitan Fever Hospitals still show a high rate, about 17 per cent., and Dreschfeld gives 17·18 per cent. as the death-rate in the Monsall Fever Hospital for the ten years ending 1894. In the United States Army for ten years up to 1896, the deaths were 19·2 per cent. (*Osler's Principles and Practice of Medicine, 3rd Edn.*).

In India our knowledge of enteric is no more advanced. As regards the Army particularly, where we are apt to think too much of ourselves, it does us good to see ourselves as others see us, and the following applies as much to India as to South Africa. Sir Alfred Fripp, C.B., C.V.O., Civilian Surgeon, South African War, and Member, Advisory Board for the Royal Army Medical Corps, in his evidence before the Enquiry Commission, says:—"He was looked upon as a crank for taking a physician out with him (to South Africa). One comment that he remembered was: 'Take as many surgeons as you like; but, my dear fellow, the one thing that our officers do understand is the treatment of enteric.' Well they do not; at least, they did not. They do now that they have had an enormous experience, but they did not understand how even to write its name down in the slightest cases, because they called it 'simple continued fever' unless it had very marked symptoms; and they allowed that man with simple continued fever to go about and infect other people, and the other people so infected might have the acutest enteric. (*The Medical Arrangements in the South African War: British Medical Journal, page* 992, *October* 17*th*, 1903.) Captain S. P. James, I.M.S., Officiating Statistical Officer to Government in the Sanitary and Medical Departments, has kindly furnished me the following information on enteric fever in the Army in India, during the last ten years.

Including Field Forces.

Years.	British Troops.		Native Troops.	
	Percentage case mortality.	Average duration of a case in days.	Percentage case mortality.	Average duration of a case in days.
1893	23·32	55·38	10 53	Not available.
1894	24·86	51·85	18 18	
1895	23·79	51·95	39·13 (33·33)	
1896	22·14	52·99	21·74	
1897	25·03	52 85	28·85 (31·25)	
1898	24·15	56·02	39·53 (35 71)	
1899	21 04	56·02	16 67	
1900	26·11	52·94	32·73	
1901	22·42	55·07	54·84 (57·14)	
1902	23·05	54·61	25 45	
Average	23·6	54	29· (28·27)	

I have not shown the figures *excluding* Field Forces, except those in brackets, as they are practically the same. The great variation in the percentage in mortality in different years in Native troops may be partly due to marked variations in the number of cases occurring or rather being reported, or to diagnosing them as such only when they died. This will also account for the higher death-rate compared with European soldiers. At present only some 30 to 50 cases among them are reported yearly, but I feel convinced that many enteric cases pass unrecognised, being returned as remittent fever, simple continued fever, diarrhœa, tubercle of lungs, pneumonia or, above all, ague, that easy refuge of the ignorant physician.

In our army, therefore, *out of every* 100 *men attacked among British troops*, 23·6 *die* (ranging from 21 to 26 in different years), and, *among Native troops*, 29 *die* (ranging from 10·5 to 54·8). So far as we can compare, they show an excess of deaths of 4·4 and 10·8 per cent. respectively over those in the U. S. Army, and 6·5 and 12 per cent. over those in the fever hospitals above quoted. I regret I have no means of comparing with the Home or the South African Army.

Now, contrast these death-rates with those of the London Temperance Hospital, for 1900 (the only one available), where out of 20 cases only one died, or 5 per cent. (*Medical Temperance Review, November* 1903), showing *nearly* 3½ *times less than the Fever Hospitals.* The figures are small but instructive, and represent, I believe, a fairly average annual percentage in this hospital. The only difference in the treatment of enteric here consists in the withholding of alcohol.

Another important particular in the treatment of enteric is the duration of the disease. Osler has it that *in the majority of cases convalescence*

begins with the fourth week, say on the 30th day; but in severe cases recovery may not ensue till the fifth or even sixth week, say, the 40th day; or relapses may protract it to a very much later date—even into the third month, or with tedious sequilæ, further still. Some cases take a year to fully recover and remain delicate long after. A glance at the Army table on page 173 will show that the European soldier in India recovers on an average *in* 54 *days* (ranging in the ten years from 52 to 56 days). I find the average duration of sickness in the Temperance Hospital for 1900 was 52·6 days; figures for other hospitals are not available. These two cases differ from the actual date of convalescence or permanent reduction of the temperature to normal, in meaning the number of days spent in hospital.

Now, what would you say to a method of treatment which resulted in a happy reduction of enteric deaths in India from 24 to only 6 out of every 100 cases treated,—just one quarter; with a duration of only 27 days sickness—just one half? How many valuable lives saved would not this represent; what suffering abrogated, what blessings bestowed! Would you not acclaim it as a great triumph of modern medicine? And yet, the method I am introducing to notice professes to do far more than this—*to reduce the mortality to practically nil;* to treat hundreds of cases without a single death and to cut short the period of sickness to from a week to a fortnight! Nay, more; it claims to juggulate or abort a threatened seizure, so that you wonder and doubt it could have been enteric at all!

This method is what I may call the *antiseptic eliminant treatment.* Now there are several antiseptic methods, professed or otherwise, with results more or less gratfying. But there are only two that I know of which command our most earnest attention, and these two are also eliminant: one is that of Dr. Woodbridge, of Youngtown, Ohio, U. S., whose results are simply startling. Out of 7,857 authenticated cases of enteric treated thereby by various doctors, there were 150 deaths, or a *death-rate of only* 1·9 *per cent.* and an *average duration of illness,* in the 4,935 cases in which the duration was given, *of only* 12·7 *days!* (*New York Medical Journal, July 24th,* 1897.) Could one possibly expect better results? Briefly, this method, somewhat complex, consists in the administration, for the first two days, of frequent minute doses of podophyllin, mercurous chloride (calomel) guaicol carbonate, menthol, thymol and eucalyptal, until free evacuation; and thereafter for two days, of larger doses of the last four and cessation of the first two; followed up with potassium chlorate for a day, as a preventative of ptyalism, and succeeded by the first recipe; and so on.

Alternative to this, and claimed to be superior to it, is the method expounded by Professor W. E. Waugh and Dr. W. C. Abbott of the Chicago *Alkaloidal Clinic* and emphatically certified by "hundreds" of physicians all over the United States, many of whom assert that since its adoption, although large mortality or prolonged convalescence were evident in their neighbourhood, under treatment by other methods, they have treated hundreds of cases without a single death, or *never had a death,*—presumably in those cases where the treatment had any chance at all; while some marvellous cures of almost moribund patients are recorded; and the duration of illness has been reduced to perhaps a lower minimum than above reported, and there are *no complications, no accidents and no sequellæ.* Unfortunately no elaborated statistics for comparison are available, and the relative merits are therefore more difficult to establish. One great advantage is its simplicity, and I am also particularly influenced by its plain common sense and its accord with true scientific principles. Nowhere else does the physician's motto of Paracelsus "*Tuto, cito et jucunde*" agree so satisfactorily, *viz.*, to cure disease safely, quickly, and pleasantly. I therefore very strongly recommend this treatment—*no matter in what stage the enteric case be seen*—whether it be only the initial malaise of a suspicious "Febricula" or the final coma of the "typhoid state"; only of course do not expect the unattainable and then condemn the method. All that is asked is to give it a thorough and conscientious trial in a series of cases, unmodified by prejudice or predeliction. Only intelligence must be exercised. Above all, kindly *publish the results,* whether failures or successes.

(1) The very first thing on being called to any case at all likely to be enteric or typhoid fever, at any stage, and whether with diarrhœa or constipation, is,—give calomel gr. $\frac{1}{6}$ with sodium bicarbonate gr. ii every quarter of an hour for six doses. Then give a heaping teaspoonful or drs. ii of effervescing sulphate of magnesia, B. P., or plain magnesium sulphate dr. i to drs. ii, repeating in two hours if necessary until free evacuation (say three or four stools). This will begin to purify and cleanse the alimentary canal—wash it out in fact. *Repeat the calomel occasionally throughout the disease,* when the stools do not show healthy bile, *i.e.*, do not become yellow instead of the pea-soupy dark brown. Repeat every morning the Epsom salts, remembering the motto "Clean out and keep clean." Because (*a*) calomel, in spite of Rutherford and the books, excites flow of bile whose functions, besides increase of peristalsis, and prevention of decomposition, are curative of intestinal lesions and very probably antidotal to toxins (*vide* Koch's Rinderpest treatment); (*b*) soda aids calomel markedly, prevents salivation and supplies a vital element to the blood; (*c*) the magnesia is also cholagogue, and both it and calomel are aperient and eliminant, the former with its watery motions being an excellent depleting agent for the congested bowels; (*d*) they remove the effete and rapidly decomposing matter in which not only Eberth's

bacilli multiply, but swarms of other saprophytic and parasitic bacteria, *the effects of whose virulence are mistaken for or superadded to those of the former* (please note).

(2) At the same time, as early as possible, give the sulphocarbolates of zinc gr. ii, sodium gr. ii and calcium gr. iii dissolved in water, every two hours, *until the stools cease to be offensive*, when the dosing is to be every four hours. As Lauder Brunton says, they are the "ideal intestinal antiseptics": the zinc salt is sedative and astringent; the sodium is easier on the stomach and less constipating; and the calcium is not astringent, supplies lime for tissue-building and assists the coagulability of the blood. They have also probably some antagonistic effect on the toxins present, although *in vitro* they do not appear to inhibit bacterial growth. Clinically, they have been proved to check fermentation, purify the stools, reduce diarrhœa, and with the aid of magnesia, *prevent further absorption of septic products*. They must be guaranteed chemically pure, otherwise they will cause irritation. Where the combined salts are not available, either of them may be used. I have found the zinc sulphocarbolate most useful up to 30 and more grains daily, but as much as 80 to 120 grains have been given daily "until the desired effect" was accomplished and without any ill effects: it is best indicated where diarrhœa prevails. Of the sodium salt Dr. W. F. Waugh says, "there seems to be no limit to the quantity that may be given with impunity. Out of the thousands of cases in which I have given the sulphocarbolates, I have yet to see an instance of hæmoglobinuria." A useful tip (Bouchard's test) is to add a few grains of bismuth to the sulphocarbolates, and when the stools cease to blacken perfect antisepsis is secured: it usually takes 30 to 40 grains per diem to do it. To keep the intestinal canal as aseptic as possible absolute asepticity is perhaps not necessary, continue dosage until convalescence. Recently acetozone, claimed to be the most powerful antiseptic known and several times stronger than Hydrarg. Perchlorid. has been administered freely, resulting in sterile evacuations and rapid cure of patients. (Procurable from Parke, Davis & Co., Chicago and Simla.)

(3) The above treatment alone (if taken early enough) often aborts the attack, reduces temperature to normal and inaugurates convalescence. In severer or more advanced cases the persisting fever (in fact pyrexia from any cause) is to be reduced as follows:—

Abbot's Defervescent Compound.—Aconitine—*Amorphous* gr. 1/134; Digitalin Germanic gr. 1/67; Veratrine gr. 134, sugar q.s. Make one tablet (or take a grain each of the first and third and half grain of the second, with sugar q.s., and divide into 134 tablets or powders). Dose—One tablet in 1 oz: hot water every ½ to one hour, according to conditions, until effect (fall in temperature, easing of pulse and respiration, diaphoresis, &c.). In urgent cases it may be given for 3 or 4 doses fifteen minutes apart. So soon as the fever breaks, or in weak, asthenic cases from the beginning, give in the same way, *Burggræve's Dosemetric Trinity* (the triad), which is exactly the same as the Defervescent, only substituting the Veratrine for Strychnine Arsenate gr. $\frac{1}{134}$th, which has a powerful toning and bracing effect on the whole system, while also assisting in controlling laxity of the bowels. Stop the dosing when the temperature approaches normal. Where these preparations cannot be got (obtainable from the Abbott Alkaloidal Co., Ravenswood Station, Chicago), try Tincture Aconite m. 30 to 45, Tincture Digitalis m. 30 to 45, Liquor Strychnine Hydrochloride m. 16 to 24, and water 10 oz. Dose—oz. 1 in the same way. Note that tannin is incompatible with alkaloids.

(4) To aid nature to destroy the invading host of bacilli, give nuclein, "the active principle of life," "the ultimate basic principle of serum therapy" (Abbott), a solid prepared from live cereal germs or from yeast, *per os*, ten m. of the solution three times a day an hour before or after food, or 10 to 20 minims twice a day injected hypodermically.

Nuclein (nucleinic acid is its chief ingredient) has the remarkable property of increasing (doubling) the bactericial power of the blood by multiplying, even up to 75 per cent., the leucocytes and phagocytes—the natural defenders of the body's health, and at the same time is a powerful systemic up-builder, stimulating cell growth. It is thus a physiological germicide and antiseptic. Note that quinine and other antipyretics are physiologically incompatible with nuclein.

(5) Dietary. Avoid solid food. Give food rich in nucleins, easily digested animal foods should predominate. No food contains nuclein in more accessible form than the yolk of eggs and next comes milk. Butter-milk and dahi or curds both prepared at home are very wholesome, easily assimilated and thirst-quenching. Junket is also good. Buffalo milk, if used, should be diluted with an equal quantity of water, as it is twice as rich as cow's milk. Boil all milk. (Remember that milk is liable to form large tough clots: prevent this by dilution with water, barley water, weak lime water or aërated water.) Raw white of egg filliped with water and flavoured with lemon and sugar is a good way of adminstering albumen to restore its loss. Give predigested foods alone or alternately with other food milk digested by zymine, starch, (arrowroot, &c.) by diastase, fat by pancreatine, meat by pepsin and hydrochloric acid or by papine. Benger's food is very good. Dr. Waugh recommends bovinine. Somatose, which contains 80 per cent. of meat albumen and is "the most powerful nutrient yet discovered," and unlike broths, causes no gastro intestinal distur-

bances, proclaims itself as one of the best foods in Enteric: it is claimed to be immediately assimilated, at once sustaining and increasing vital force. Give plenty of water to replace consumption by fever and to flush the emunctories.

(6) Avoid, first, alcohol and second, opium: because these are sedative in small and narcotic in large doses; they deceive by giving a false idea of stimulation; they are not nor can they ever take the place of real food; they mask the symptoms of the disease and thus lead astray proper treatment. More deaths in enteric than saving of lives are due to their exhibition, especially of alcohol. If it be necessary to give morphia let it not be continued beyond the temporary urgency.

"TRYPANOSOMIASIS."*

BY H. P. DIMMOCK,

LIEUT.-COLONEL, I.M.S.

WHEN I was at home on leave last year, I paid a visit to the London School of Tropical Medicine, and had the pleasure of hearing Sir Patrick Manson deliver a lecture on the subject of Trypanosomiasis in the laboratory of the school. The lecture was illustrated by microscopical specimens of various forms of trypanosoma and a patient suffering from the disease, and I have brought with me a specimen of the parasite that occurs in human beings from the blood of this patient which is now exhibited.

I was much impressed with the advance the London School has made, and I was very pleased to be assured that this advance will be greatly furthered by the additions that are being made to the buildings through the generosity of Mr. Bomanji Petit of this city.

The term trypanosomiasis is used to denote a disease in the human being, which is characterised by certain symptoms of fever of long continuance, gradual and general deterioration in health, anæmia, a peculiar condition of the skin, and a profound affection of the nervous system—all of which are also associated with the detection in the blood and the cerebro-spinal fluid of a peculiar parasite—the trypanosoma. The discovery of this parasite in human blood in such cases has given a great impetus to the investigation of the blood in diseases of certain tropical regions, and the most recent startling announcement is that of the presence of a trypanosoma in the cerebro-spinal fluid of cases of sleeping sickness.

A parasite of this description had, however, been observed in animals for some time, and the organism of surra has long been familiar to observers in India, but the discovery of such a parasite in the human being in so-called trypanosomiasis, in sleeping sickness (apparently the acute form of trypanosomiasis) and in forms of spleno-megaly diseases which are peculiar to Africa, is of more recent date, though the exact relationship of the parasite to each disease is still indeterminate. Moreover, it is probable there are different forms of trypanosomiasis in the human being.

Different species of the trypanosoma are also described, so that the terms trypanosoma Gambiense, T. Brucei, T. Lewisi, indicate different organisms, having different qualities owing to host, location and other circumstances.

In certain animals in Africa, one fact stands out prominently, and that is the communication of the parasite and the development of the disease by inoculation from the tsetse fly. It is interesting to note how the sharp and formidable proboscis is practically an inoculation needle, and it can be easily understood how these insects pass from animal to animal and carry out their inoculation processes through a blood infection. This fact is so generally recognised in Africa that the disease, as it occurs in cattle and horses, is known as the tsetse fly disease.

As to the communication of the parasite to the human being, we are still wanting much knowledge, but with the definite fact of the infection of malaria through the mosquito, it may be conjectured, and possibly in the future discovered, that there is some particular insect-carrier to the human being for trypanosomiasis. With the presence of surra in India, therefore, and the possible connection of disease of lower animals with obscure forms of fever in human beings, we are urged to an intense interest in any light that can be thrown on trypanosomiasis. The occurrence in Bombay two years ago of epidemic dropsy† in two or three families was vividly called to my memory by the condition of Sir Patrick Manson's patient. He was suffering from the peculiar circinate eruption of the disease, and the resemblance of these patches to the general congestive œdema of the Bombay cases of epidemic dropsy was notable. The nature of the fever is also undulatory, and this form of pyrexia often occurs in Indian fevers without any other symptoms to account for the peculiarity, so that it is as well for us to be on the alert for the discovery of some such parasite in this country in human beings. The disease of epidemic dropsy particularly requires investigation. The presence of trypanosoma in rats is well known, and in many cases they appear to suffer no inconvenience.

* *Being a Paper read at a Meeting of the Bombay Medical and Physical Society.*

† For recent accounts of epidemic dropsy in India, see, *I. M. G.*, August 1901, July 1902, and March 1903. The hint here given by Lt.-Col. Dimmock is worth following up.—ED., *I. M. G.*

The microscope evidences of the disease in the blood of human beings requires still further investigation and to be supplemented by experiments on animals. These, however, are not yet decisive, though recently the disease has been produced in monkeys by inoculation.

I have to thank Dr. Meyer and Dr. Powell for exhibiting specimens of trypanosoma, human and other, and Piroplasma Donovani.

A Mirror of Hospital Practice.

NOTES ON A FEW SELECTED OPERATION CASES AT THE PETIT HOSPITAL, BOMBAY.*

BY M. A. T. COLLIE,

LIEUT.-COLONEL, I.M.S.

I AM not in favour of bringing forward in a paper "cases" as "cases," but the following which came under my care during the period I acted in charge of the Petit Hospital are, I think, of clinical interest:—

CASE I.—*Pyo-Salpingo-Oophoritis.* A woman of good physique sought admission on the 17th July last on account of profuse purulent discharge from the vagina. On examining with the speculum, pus was seen to pour through the os uteri, and the quantity was distinctly increased on pressure over the hypogastrium. On bimanual examination the uterus could be felt deflected to the right of the middle line and fixed in that position; length normal; extending from the right cornu to the right iliac fossa a little above the brim could be felt a rounded sausage-like tumor, which appeared to be continuous with a mass in front of the fundus. On the left side could also be felt a sausage-like swelling springing from the left cornu. In the pouch of Douglas was a swelling continuous with the last and not separable from the fundus uteri. With the external hand, the fundus uteri could be distinctly distinguished lying between the anterior and posterior masses, with a shallow sulcus between each. Diagnosis—pyosalpinx—and operation recommended. Patient refused operation, but assented to stay in hospital under treatment. Treatment was directed mainly towards inspiring confidence, in the hope that she would subsequently assent to an operation. The discharge of pus was so profuse that it was difficult to keep the patient clean. During the six weeks she remained in hospital the temperature ranged from 99½ to 101, always persistently higher when the flow of pus diminished. This persistent fever has not been a distinguishing symptom in other cases of pyosalpinx. Notwithstanding the fever the patient is well and did not appear to suffer in general health, though her complexion was always of a "dirty" colour. Ultimately, on the 28th August she assented to operation. On opening the abdomen the uterus was found in the position already indicated, and the enlarged thickened Fallopian tubes much convoluted. The right tube extended up to the right iliac fossa, where it was adherent; the vermiform appendix was adherent to its surface; doubling back on itself, the tube extended to a mass, the size of Tangerine orange, lying in front of the uterus and firmly adherent to the uterus and bladder; on the surface of this mass was an equally large thin walled cyst with clear contents. The left tube doubled back before reaching the brim of the pelvis to an equally large mass adherent to the lower two-thirds of the posterior surface of the uterus and the surface of the rectum. The adhesions were so old and highly organised that at first sight the case appeared inoperable. After making an attempt with a blunt dissector on the anterior mass, I decided to try and remove the masses. The appendix and the thin walled cyst were first removed, and after an operation lasting about two hours, the diseased masses were successfully dissected away from the surrounding structures without any leakage of pus. The patient made an excellent and uneventful recovery. The ovaries were found to be completely disorganised and little more than pus cavities draining through the Fallopian tubes.

CASE II.—*Ovarian cyst—twisted pedicle.*—A woman, aged 30, was transferred from the J. J. Hospital on the 10th October, where she had been admitted 14 days previously for pain in the abdomen. Had observed a tumor in the lower part of the abdomen for five or six months, but it had given no trouble until the sudden onset of pain. There were no urgent symptoms on transfer to the Petit—the pain had diminished but became worse when she attempted to walk about. Her skin having a pustular eruption, operation was not proposed to the patient at once. On operating on the 5th day after admission, a large quantity of sero-sanguineous fluid escaped on opening the abdomen; a left ovarian cyst was found with a long pedicle showing three turns. The cyst walls as well as the tissues comprising the pedicle were extremely friable, so friable that it was difficult to find sufficiently sound tissue to tie the pedicle; the cyst must have ruptured or pedicle cut through in a few more days. The patient made an uninterrupted recovery.

CASE III.—*Enlarged spleen; much elongated pedicle allowing spleen to occupy right side of abdomen; acute symptoms from twisted pedicle.*—This patient was in great distress when I was called to see her, and could give a most unsatis-

* *Paper read at the Bombay Medical and Physical Society.*

factory account of herself. The facts relating to the "history" were obtained subsequently from her. Born in Mauritius, she had suffered from enlarged spleen for 11 years, but had no recollection of having had fever. She was a small woman, about 22, and had a very cachectic appearance. Began to have pains in the abdomen in October 1902, and she was treated for enlarged spleen. About March or April 1903, she was informed that the spleen was cured, but that she had an enlarged liver, and she continued under treatment for some time, doing her work as a child's nurse. In June last she was seized with sudden acute pain whilst asleep, which she relieved by means of a sinapism; the pain never completely disappeared, but was not more severe than what she had had in the previous October. On the 10th July the pains became very severe, but she treated herself with counter-irritants, and made no complaint to the lady of the house which she was visiting with her charge. On the 22nd July the lady having observed the manifest enlargement of the abdomen and the distress of the girl, sought advice, and was informed that the tumor was a phantom one. The lady stated to me that she looked as though six or seven months pregnant. On the 9th August the pains became very severe, and she returned to Bombay. Went to the European Hospital on the 13th, where she got medicine, which afforded no relief. On the 15th August, when I first saw her, the patient was in great distress; was unable to remain in one position but alternately lay in bed, walked or sat doubled up in a chair. Had been unable to retain food for six days, and during that period had slept little. Constipation, which resisted all drugs, was marked, and there was obstinate vomiting. Pulse 120, temperature 100; expression anxious and pinched, and skin bathed in perspiration. I found the abdomen occupied by a large hard tumor on the right side extending from the Poupart's ligament to the costal arch but separable from the liver. The tumor extended about 2 inches to the left of the middle line between the umbilicus and pubis and, on the right side, into the lumbar region, where its outline could be distinctly felt. It was hard, smooth and mobile; the contour towards the middle line was well defined and presented a slight depression opposite the umbilicus. As there were no facilities for observing or looking after the girl, I arranged for her transfer to hospital, where I examined her under chloroform on the following day. I had made no definite diagnosis. Clinical observation in hospital threw little light on the case; urine normal. Under chloroform, vaginal examination showed a virginal condition; the lower end of the tumor extended down behind the pubis, pressing on the neck of the bladder; uterus normal and mobile, and nothing very definite could be made out in the pelvis, except that the tumor could be felt occupying the right side. On percussion over the splenic region an area of dulness could be marked out as large as is often found with a normal spleen, and on deep palpation it appeared that one could feel the spleen in its normal position. Both Colonel Burke, who assisted me subsequently at the operation, and I observed independently that the tumor "felt like an enlarged spleen on the wrong side of the body." My diagnosis lay between a sarcoma of the ovary with a twisted pedicle and a renal tumor. At the operation a very large quantity of highly-colored sero-sanguineous fluid escaped on opening the abdomen; a large dark slate-coloured, apparently solid, tumor was found occupying the whole right side of the abdomen, which appeared at first sight to be fixed to the spine, but on raising the tumor the pedicle was found to extend as a broad twisted band into the splenic region; it was this broad band which I had taken for the spleen; the tumor was the spleen displaced. A portion of the intestines was pressed flat against the spinal column, accounting for the gastro-intestinal symptoms; the intestines presented nothing abnormal in appearance. On examining the pedicle a double twist was observed, and in order to undo this the spleen had to be lifted out of the abdomen. Colonel Burke and I discussed for a few minutes the advisability of removing the spleen altogether, but felt that the condition of the patient was not such as to warrant it. In fact, we had to finish the operation so quickly that the fixing of the spleen in its normal position was likewise considered impossible. Before closing the abdomen the colour of the spleen had markedly improved and its consistence was softer. The patient made an uninterrupted recovery, and, when the dressings were removed, the spleen was found adherent to the abdominal wound and diminished to $\frac{1}{6}$th of its former size. When I saw her recently, five months after the operation, the spleen was still in its mesial position, and further reduced in size under continuous quinine treatment. How long the organ will remain safely anchored in this position it is impossible to say, and there is, of course, considerable risk in being unprotected. The girl knows the risk, wears strong corsets, and understands that on the first sign of trouble she must seek advice. The case is of interest on account of its unique character, and teaches us to be tolerant towards our brother practitioners' diagnoses; it would be disconcerting to most of us to find a tumor which we had treated as an enlarged spleen transferred to the other side of the abdomen!

Regarding these last two cases the question of the time that the pedicles had been subjected to a twist is important. In case II the period was certainly not less than three weeks. In case III, from subsequent conversation with the girl, I believe that the first twist occurred in October 1902, nine months before operation; the second twist probably in June, two months before operation.

CASES FROM THE MEDICAL WARDS OF THE MEDICAL COLLEGE HOSPITAL, CALCUTTA.

BY D. McCAY, M B.,
CAPTAIN, I.M.S.,
Resident Physician.

SARCOMA OF THE PLEURA.

THIS patient, Ganesh Dhul, Hindu, age 20, fisherman by occupation, was admitted into the Medical College Hospital (Major F. J. Drury's wards).

History.—The patient states that two months before admission he was suddenly attacked with acute pain in the right side just below the 12th rib; this pain lasted for an hour and then disappeared. He had several similar attacks afterwards. Fifteen days before admission he noticed a swelling in that region after the cessation of the pain; this swelling gradually increased until the present time. He gives no history of fever during this period and had no cough.

No history of tubercle, syphilis or traumatism on examination.

Patient emaciated, sallow complexion, anæmic, eyes slightly jaundiced, admission temperature 100°.

Inspection showed great bulging of the right side of the chest, more marked at the lower part and behind. No respiratory movements to be observed.

The physical examination of the chest pointed conclusively to the presence of a large pleural effusion on the right side.

The only further point of interest being the seemingly great enlargement of the liver, the margin of which could be felt below the umbilicus. [The cause of this was cleared up at the *post-mortem*.] The dulness over the fluid and of the liver were continuous, so that it was impossible to say whether the liver was really enlarged or simply displaced downwards.

The patient was admitted on the 3rd September 1903. On the 9th September, 64 ozs. of fluid were drawn off. Again on 25th September, 56 ozs. more obtained. The fluid drawn off coagulated on standing and had a specific gravity of 1025.

During the latter part of September the bulging at the level of the costal margin increased rapidly on measurement—right side, 17¼ inches; left side, 14½ inches.

The liver therefore fell under grave suspicion of being the chief cause of the trouble; accordingly on 2nd October an exploratory aspiration was made behind over the region of the liver [the needle did not reach the liver, as it was greatly displaced downwards], and, on examining microscopically, the slight amount of tissue aspirated into the needle, sarcomatous cells were discovered.

The disease was therefore regarded as one of sarcoma of the liver (small round celled).

The patient grew rapidly worse and died on the 6th October.

Post-mortem Report.—A large diffuse tumour involving the whole right pleura was found, the pleura was greatly thickened on both visceral and parietal layers, which were separated by a quantity of bloody serum (about 36 ozs.). The growth on parietal layer involved the chest wall infiltrating the muscles and bones.

The diaphragm was also involved by the growth. The right lung was practically non-existent and was represented by a thin layer of carnified tissue.

The diaphragm was greatly thickened and pushed down to the level of the costal margin, thus displacing the liver downwards, the lower margin of which reached to the brim of the pelvis.

The other organs of the body showed nothing of any particular interest.

Sections of the specimen were cut and were considered to be those of a small round cell sarcoma.

TWO CASES OF HYDROPHOBIA.

Case I.—Nilmony Mukherjee, Hindu, age 35 male, was admitted for hydrophobia on the 8th October 1903 (Lt.-Col. Harris' wards).

The patient had been bitten on the left leg and left thumb three months previously by a dog said to be mad. The wounds healed quickly and gave him no trouble.

On the 7th October he was noticed to be avoiding water and was depressed. He was irritable and told his father he was going mad. On being given water to drink he experienced a good deal of difficulty in swallowing.

Admitted on 8th October. He showed marked signs of hyperæsthesia, being extremely restless and excitable. He had violent reflex spasms on attempting to drink, and even the verbal suggestion of water was sufficient to call the spasms forth. The room had to be darkened as he complained of the light.

Speech was clear between the spasms, but during them the words were rapidly jerked out and more or less run into each other. He also complained during the spasms of a suffocating sensation. Mind quite clear, recognises his friends. Reflexes, knee-jerk lost, no ankle clonus.

On the 9th October the muscular system gradually became weaker, and he was unable to sit up or stand without assistance. He gradually became quieter and sank into unconsciousness, and died on the morning of the 10th October.

During the illness the temperature was only slightly raised, 101·5°. The saliva was not swallowed, but ejected all round him. There was no dribbling. He died within three days of the appearance of the first symptom.

Case II.—Chedi, Hindu, age 30, male. The signs and symptoms were very similar to those of the first case.

He was admitted on 31st October at 8-15 A.M. and died at 12-30 P.M. of the same day.

The only point of further interest in this case was the length of time that elapsed between the bite and the appearance of the symptoms.

He stated that eighteen months previously he had been bitten by a mad dog on the right ankle. This was followed by a good deal of bleeding and he went to a native medical man who cauterized the wound.

His symptoms only began on the morning of the day previous to his death, so that the disease was even more rapid than in the first case.

No *post-mortem* was obtained in either case, so that the diagnosis was not confirmed after death.

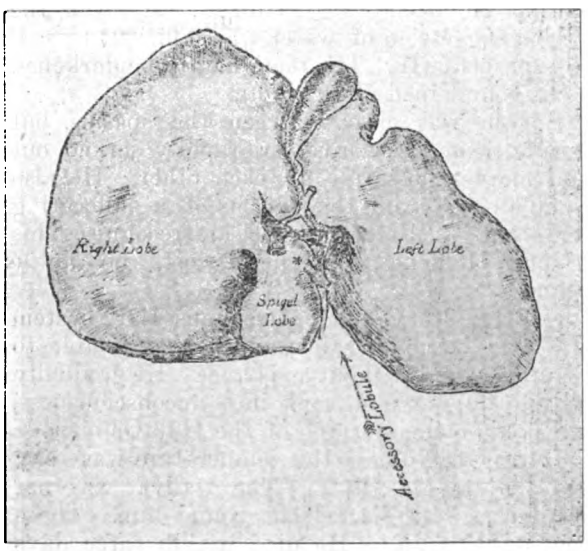
A CASE OF ACCESSORY LOBULE OF THE SPIGELIAN LOBE OF THE LIVER.

By VICTOR E. H. LINDESAY.

CAPT., I.M.S.,

Civil Surgeon, Comilla.

DURING the *post-mortem* examination of a young Hindu male, who had committed suicide by hanging on the 25th instant, I noticed the following abnormality of the liver, which was otherwise healthy. A small pedunculated olive-shaped lobule was attached by a thick root to the left border of the spigelian lobe at the junction of its anterior and middle thirds. This lobule was $\frac{7}{8}$ inch long by $\frac{5}{8}$ inch in its widest diameter, and on section was seen to be composed of liver substance. It hung backwards and downwards over the ductus venosus, but was sufficiently moveable to be readily turned forwards towards the transverse fissure.



The accompanying figure drawn from a rough sketch of the organ, as it lay on the table, represents the position and appearance of this anatomical curiosity.

POISONING BY ATROPINE.

By A. CHALMERS, M.D. (ABERD.),

CAPTAIN, I.M.S.,

District Medical and Sanitary Officer, Kurnool, Madras.

ON 23rd January 1904, I was called to see a man and his three children admitted to hospital with symptoms of poisoning.

History.—These four people had taken their usual food at 7 o'clock on the previous evening, which consisted of baked cholam and gram with some chillies. During the meal they noticed tingling and dryness in their throats and the man rapidly became delirious.

Case A.—Man, Bya caste, aged about 55 years. He was lying on the ground, and the first thing I noticed was the incessant movement of the jaws biting and chewing and grinding of the teeth. His arms were flexed at the elbows, and a peculiar irregular clonic spasm passed over his arms and shoulders. He was unable to stand. Some muscular rigidity of the legs and reflexes present. Mouth dry and pharynx deeply congested, voice hoarse, muttering delirium, eyes half closed, pupils widely dilated, and right eye shewed circum-corneal injection. Temperature 100·5, pulse 100, regular, moderate tension, respirations 14, slow and shallow. Skin very dry, but no eruption visible. Enormous distension of intestines and stomach; all secretions stopped.

Urine, 22 oz. withdrawn by catheter, clear, acid reaction, no sugar or albumen. Sp. gr. 1010.

Case B.—Girl aged seven. Symptoms much the same, but not so well marked. She could stand, but could not walk. In this case the eyes were widely opened giving her a peculiar staring appearance. She made continual purposeful movements with her hands, making a drinking cup with them, drawing out an imaginary thread. She also had vivid hallucinations at one time.

Case C.—Child aged five years. Only slight symptoms, dilated pupils, dry mouth, restlessness and clutching at imaginary objects.

Case D.—Child aged two years. No symptoms

Treatments—The hospital assistant had given *A* and *B* apomorphine m.v hypodermically and the result was in each case about two ounces of digested food and mucus. I washed out the stomach in *B*. Morphia was administered, hot bottles and turpentine friction. At 1-30 $\frac{1}{8}$ gr. pilocarpine was given and repeated at 5-30. At 9-30 $\frac{1}{8}$ gr. pilocarpine was given to *A*. Next morning at 6, both *A* and *B* passed water and went to stool.

I saw them at 8 A.M. on that morning and found them quite rational and able to answer questions; but *A* was still very excited and had widely dilated pupils. These symptoms gradually passed off and they left the hospital on 26th January.

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SPLENIC CACHEXIA.

READERS of the medical journals are aware of the distinct advance which has recently been made into the nature of those chronic cases which have for years past been classed under the head of Malarial Cachexia. That they are very common everyone knows, that their treatment is disappointing will also be admitted, and there can be no doubt that it is the thousands of such cases dying in India which has led, on the village *chowkedar's* initiative, to the very high number of deaths attributed to malaria. So far as a limited number of individual cases go, which have been examined by Leishman, Donovan, Ross, Bentley, Rogers, Christophers and others, there seems to be no doubt that they are due to the parasitic bodies which now go by the name of Leishman-Donovan bodies. It is, of course, possible that all cases of what has been called "tropical splenomegaly" are not due to this one species of parasite, but there is considerable evidence that this may be so. It is moreover obvious that there is abundant scope and material for working at this problem, for not only have these parasitic bodies been discovered in Europeans who have been invalided home from India, but Bentley, Christophers and L. Rogers have recently discovered in them cases of *kala-azar*, and Donovan, in Madras, one of the original discoverers, has found them in natives of that Province. The question therefore remains, are these bodies the cause both of individual cases of splenic cachexia, and of the great so-called malarial epidemics, of which the Burdwan Fever of the seventies, the *kala-azar* of Eastern Bengal and Assam, and the terrible "malarial" epidemic of a few autumns ago in the Punjab are the best known examples?

As the subject is one of great importance at present we may take the opportunity of quoting from an interesting article in the *Journal of the Royal Army Medical Corps* (March 1904, p. 310, &c.) in which Major Leishman sums up the main symptoms of the disease.

"(1) *Splenic enlargement.*—This occurs early and seems a constant feature. The enlargement is usually very great and appears to be frequently accompanied by a pain....

"(2) *Hepatic enlargement.*—A certain degree seems always to accompany the splenic enlargement. ...The enlargement of the liver is important in view of the fact that, in most instances, the parasites have been found in this organ as well as in the spleen.

"(3) *Cachexia.*—The peculiar earthy pallor of the skin and the intense degree of emaciation which accompany the later stages of the disease are very striking.

"(4) *Temperature.*—The long-continued, irregularly remittent or intermittent charts furnished by these cases are in themselves characteristi c in the absence of any other definitely ascertained cause, for the almost constant pyrexia.

"(5) *Hæmorrhages.*—Epistaxis, bleeding from the gums, &c., have been mentioned in many of the recorded cases and formed a marked feature in this instance.

"(6) *Purpuric eruptions and subcutaneous hæmorrhages* have also been mentioned and are once more in evidence in this case.

"(7) *Transitory œdemas* of various regions or of the limbs appear to be frequent and are especially mentioned by Donovan in connection with his cases.

"(8) *Headache.*—Severe and persistent headache is not uncommon.

"(9) *Effects of medication.*—In none of the cases so far recorded have drugs proved of any service in modifying the course of the disease.

"(10) *Complications.*—The frequency with which congestion of the lungs, diarrhœa and dysentery appear in the course of the disease is noteworthy.

"(11) *Blood count.*—In several cases a large increase in the relative proportion of the large mononuclear cells, unaccompanied by a general leucocytosis, has been observed, the figure reaching 14 per cent. or even higher. This, if confirmed by further experience, is interesting in view of the importance which has of late been attached to an increase of these cells as affording evidence of recent malaria."

It will be agreed that the clinical picture here given is a familiar one, the long-continued and irregular temperature charts are certainly characteristic. In conclusion, while commending the study of this class of case to our readers, we would deprecate the use of such terms as "Dum-Dum Fever" or any other which seems to give a local habitation as well as a name

to a type of continued cachexia, which is probably of universal distribution in the tropics.

LONDON LETTER.

DIPLOMAS IN TROPICAL MEDICINE.

The Universities of Cambridge and Liverpool have decided to grant diplomas in tropical medicine, and have issued regulations as regards the requisite curriculum and examination. The Cambridge regulations are somewhat vague as regards curriculum. Candidates must be registered medical practitioners of at least one year's standing. They are required to produce evidence of "having diligently studied pathology (including parasitology and bacteriology) in relation to tropical diseases, clinical medicine and surgery at a hospital for tropical diseases and hygiene and methods of sanitation applicable to tropical climates." The duration of these courses of study is not defined, and a composition on some subjects connected with tropical medicine or hygiene or the possession of a recognised certificate or diploma in public health or sanitary science is to be taken into account as a qualification for admission to examination and for the grant of the diploma. The rules as regards the examination are more explicit. It is to be conducted by the State Medicine Syndicate, which has been enlarged for the purpose; and the subjects of examination are laid down in detail. They are — (1) "The methods of pathological and bacteriological investigation, the examination of the blood, the character, diagnosis, and life history of animal and vegetable parasites; the examination, chemical and microscopic, of poisonous or contaminated foods and waters. (2) The origin, pathology, propagation, distribution prevention, symptoms, diagnosis and treatment of the epidemic, endemic and other diseases of tropical climates [a list of these is given]. (3) The general effects on health in the tropics of season and climates, soil, water and food; personal hygiene, acclimatization, principles of general hygiene with special reference to food and water-supplies, sites, dwellings, drainage and the disposal of refuse; the sanitation of native quarters, camps, plantations, factories, hospitals, asylums, gaols, pilgrim and coolie ships; principles and methods of disinfection." The first examination is to take place in August. The Liverpool regulations are shorter. The new diploma is to be indicated by the letters D. T. M. The examination is open to all qualified practitioners who have (1) taken a three months' course of study in tropical pathology and hygiene in the University, and (2) a course of instruction in a hospital recognised by the University, in which beds are specially reserved for tropical diseases. Examination will be held at the end of the Autumn, Lent and Summer terms. These measures constitute a distinct advance in the recognition of the value of a special training in tropical medicine and hygiene for those who intend to practise in the tropics, whether in the public services, as medical missionaries or as company or private practitioners. The owners of liners visiting tropical ports, who employ doctors for the benefit of passengers and crew, ought in future to require the possession of a diploma of tropical medicine or some similar evidence of competence to treat cases of tropical disease.

AN ENGLISH HOSPITAL REPORT.

In my last letter I made some remarks on the preponderance of the arithmetical element in Indian Medical reports. Since inditing these I have received the report of St. Bartholomew's Hospital for the year 1902, It is a large octavo volume of 554 pages. It contains (1) a list of subscribers and exchanges (11 pages); (2) a biographical notice of the late Dr. Walsham (22 pages); (3) papers on a variety of subjects by members of the hospital staff (236 pages); (4) proceedings of the Abernethian Society; (5) list of specimens added to the museum; (6) list of books presented to the library; (7) summary of scholarships and prizes; (8) list of prizemen; (9) hospital staff; (10) index (74 pages). The rest of the report, covering 211 pages, concerns the transactions of the hospital. There is a summary of statistics and a statement of occupations of male and female patients. The statistics of the Medical and Surgical divisions are presented separately. There is a short summary of patients treated and results, and a detailed return of diseases of patients classified according to age. In the Medical section there is an elaborate index of diseases and chief symptoms with references to hospital record. In the Surgical there is an elaborate return of operations and their results also subdivided according to age, and a return of anæsthetics administered, with detailed record of fatal cases. Abstracts of remarkable cases are given alphabetically arranged; of cases of "hospitalism" and of those investigated by

X-rays. An excellent index of *postmortem* examinations concludes the volume. This brief display of the contents of the report indicates the preponderance of the professional element as distinguished from the statistical and administrative. The volume represents the business of the institution and the work done in its double aspect of school and hospital. It is full of professional instruction, not only contains much useful and interesting information, but indicates where more may be obtained. I am not prepared to contend that many Indian hospitals ought to present reports equally elaborate and full of medical and surgical knowledge, but the chief educational hospitals of presidency capitals might, with advantage, make public the valuable results of the work done in them. With the curtailment of arithmetical stuff, much of which is inaccurate and much devoid of utility, I am in active sympathy; but I do think that administration and practice should obtain more distinct and extended notice in Indian hospital reports than at present.

DENTAL SURGEONS FOR BRITISH TROOPS.

An important and much needed measure has been adopted in the appointment of eight dental surgeons for service with British troops in this country. These gentlemen are to receive £365 a year and travelling expenses. They are to be stationed in large military centres and may be deputed to other places where their services may be required. Those who have had medical charge of British soldiers know how much need there is for attention to their teeth and how much decay and loss of teeth is caused by want of such attention. This is specially true of soldiers who have served in the tropics and suffered from malaria. The importance of sound teeth was very strongly indicated during the late South African War, and under any and all circumstances the proverbial merit of the "stitch in time" is now here better illustrated than in the case of the teeth and gums. At Haslar hospital newly-appointed naval surgeons are specially instructed in dentistry and dental surgery. This is no doubt an excellent thing for "those who go down in ships," but dentistry is so very special a branch of practice that it is better, when possible, to engage specialists who have a thorough knowledge of the craft than trust to a smattering gained from a few months' casual instruction. Every doctor aught of course to know something of dentistry, but for preventive and preservative purposes, as distinguished from mere relief of pain, more than something is needful.

ANTI-TYPHOID INOCULATION.

In the March number of the *Practitioner* Dr. E. A. Wright, lately Professor of Pathology in the Army Medical School, Netley, concludes an elaborate dissertation on the rationale method and effect of inoculation against enteric fever as devised by himself. He produces and submits to a critical analysis all the statics of preventive inoculation as practised by himself and others. His conclusions as regards the degree of protection attained and the consequent amount of life saved are these :—

1. "A study of the statistical material will show that * * * the incidence of typhoid fever was diminished by at least one-half in the inoculated." In certain cases the reduction was greater.

2. "In the aggregate the proportion of deaths to cases among the inoculated has been rather less than half that among the uninoculated."

3. The combined effect of the diminished incidence and diminished case mortality has been a fourfold reduction.

4. The duration of protection persists for to the second or third year.

The Editor of the *Practitioner*, in commenting on these conclusions, considers that in the Army at any rate facilities should be afforded for those inclined to have the operation done under safe and proper precautions, particularly when likely to be exposed to infection. With this view I am inclined to agree.

K. McL.

15*th March* 1904.

Current Topics.

MOSQUITO BRIGADES AT WORK IN BRAZIL.

THE greater deadliness of yellow fever, as compared with the malarial fever, is, we presume, the cause why so much more energetic measures are taken in even South America against mosquitos than in India. For instance, in a sanitary report from Brazil, at Rio, we read that the "mosquito brigade" cleansed in one month (December last) 428 localities where there had been deaths from yellow fever, and destroyed 171 foci of larvæ from the roofs of different houses, 8,876 buckets of dirt were removed, 43 cartloads of dirt carried away, and 356 kilograms of pyrethrum were used for destroying mos-

quitos. We also read of 649 inoculations against plague, and of 24,441 rats being destroyed, incidentally the decrease in yellow fever is noticed.

It seems to us that what can be done in Brazil might well be more largely applied to Indian towns. The authorities of Rio de Janeiro if unable to command success have done more, they deserve it.

SEA-SICKNESS.

THE prophylaxis recommended in the following note on sea-sickness is, at any rate, worthy of record here. It is taken from an article in *American Medicine* (*apud, the Medical Chronicle*, March 1904).

"Sea-sickness has three causative factors (1) an excessive and irregular contraction of the body muscles, including those of the abdomen and diaphragm due to temporary loss of equilibrium; (2) excess of bile secretion, this bile being forced by the spasmodic muscular contraction back into the stomach; (3) a mental state which makes every muscular action, normally unconscious, into an active movement. Treatment, or rather prophylaxis, should be started several days before the voyage is commenced, and all the above defects should be treated. Podophyllin gr. $\frac{1}{20}$ should be given four times daily. Calomel should be used a few times to clear the bowels, and sodium bromide 5 grains should be given twice daily for five days before embarkation and should be continued till the patient has acquired "sea-legs." The bowels must be kept loose till all danger of nausea has passed away."

PIROPLASMOSIS IN MAN.

THE remarkable article which we publish in this issue from the pens of Dr. Lingard, the Imperial Bacteriologist, and Major E. Jennings, I.M.S., of Bareilly, are deserving of the attention of all interested in the differentiation of the fevers of India. It is possible that we are on the verge of important discoveries. Last month we gave a description of the tick or spotted fever of the Rocky Mountains, and in view of the present article by Dr. Lingard and Major Jennings, we reproduce in some detail a most valuable paper, by Dr. John F. Anderson, on spotted (tick fever) of the Rocky Mountains, "a new disease," recently published by the Public Health Department of the Marine Hospital Service of the United States (Bulletin No. 14). We need hardly say that we welcome a discussion of these important questions.

THE French Yellow Fever Commission have recently returned home "fully convinced that yellow fever is capable of transmission by the mosquito alone."

UNDER the title "*Echoes from the Past*" the *Journal of the R. A. M. C.* is publishing a most interesting series of letters from the late Sir Thomas Longmore, afterwards for many years Professor of Military Surgery at Netley. From a perusal of these it is apparent that the lately deceased "War Office" was like the Bourbons and had learnt nothing or would learn nothing. At times the letters read as if they had been written during the progress of the late war in S. Africa.

WE confess to having read with considerable sympathy Major R. J. S. Simpson's review, in the March issue of the *Journal of the R. A. M. C.*, of the recent "Enteric" special number of the *Practitioner*. In the words of the immortal Bigelow, "they don't know everything down in Judee," nor in England either, and few who are well acquainted with the literature of the enteric question in India will dispute the following remark of Major Simpson:—

"There is abundant evidence that the existence of enteric fever does not depend solely, nor in many places even largely, on water infection." One argument on this point, put forth in 1900 by Major T. McCulloch, R.A.M.C., has not been answered, *viz.*, that while cholera is now almost entirely extinct among British troops in India, due mainly to improved water-supply, enteric fever remains as prevalent as before.

WE recently had an opportunity of seeing a a little book on *Malarial Diseases*, by Dr. Reinhold Ruge, a Medical Officer of the German Navy. It is on the whole a good book, but marred by the fact that the author seems to imagine that Koch is the only modern who has ever written on malaria. The author has definite ideas on the proper use of quinine, and we quote them, as we have for long advocated large doses of quinine both for curative and prophylactic use. Ruge recommends fifteen grains of quinine four or five hours before the impending paroxysm and to repeat this dose at the same time daily for five or six successive days. Fifteen grains is the minimum dose for an adult if the blood is to contain enough quinine to kill the parasite. For prophylactic use Ruge gives 15 grains on two successive days at intervals of ten days, this practice to be continued for three months after the disappearance of all febrile symptoms.

We firmly believe that much of the disrepute which quinine has had, especially amongst Native practitioners in India, is due to two causes,—first, that it is often used in doses far too small to be useful, and, secondly, it is too often used in "fever" cases which are not malarial at all. Here, as in so many cases, accurate diagnosis must precede any treatment which is to be successful.

WE understand that Capt. S. P. James, I.M.S., has discovered, in the tissues of a number of cases of Delhi sore, parasitic bodies, which seem to be morphologically identical with the

Leishman-Donovan bodies. We shall look forward to Capt. James' report on these parasites with great interest.

DR. A. E. WRIGHT, lately Professor of Pathology at Netley, ends an article on the value of antityphoid inoculation with the following cryptic remark :—"I had intended to complete this paper by narrating the singularly characteristic inner history of this endeavour to reduce the death-rate from typhoid fever in the British Army. I find that it may contribute to the advancement of the cause I have at heart if I postpone putting on the mantle of the historian." We note that it is proposed to hand over the investigation into the value of the antityphoid inoculations to a Special Commission.

THE burning of pyrethrum powder to destroy mosquitos (1lb. per every 1,000 cubic feet of space) has been given up in America in favour of sulphur burning, which is far more destructive to mosquitos.

Reviews.

A Manual of Medical Jurisprudence for India. —By Lt.-Col J. B. GIBBONS, I.M.S., Civil Surgeon, Howrah, and formerly Professor of Medical Jurisprudence in the Medical College, and Police Surgeon, Calcutta. G. W. Allen & Co. Calcutta, 1904.

WITHIN the past 18 months no less than three valuable treatises on Medical Jurisprudence have appeared from the pens of officers of the Indian Medical Service. We refer to the *Legal Medicine* by Collis Barry of Bombay, the new edition of Lyon's, edited by Lt.-Col. Waddell C.I.E., and the present volume, which embodies the vast, we might almost say, unique, experience of Lt.-Col. Gibbons as Police Surgeon in Calcutta. This volume is largely original, the descriptions and statements being based upon the author's eight years' work as Police and Coroner's Surgeon in Calcutta. In the general arrangement and manner of dealing with the different subjects, the author has followed the lines of that standard work in German, by Von Hofmann, the Professor of Legal Medicine in Vienna.

The portions of the introductory chapter which deal with medical evidence, and the writing of medico-legal reports struck us as particularly good and the distinction between ordinary evidence tendered by a medical man and the expert evidence of a medical witness is clearly put. We incline to agree with the remarks of the author on the unsatisfactory, and often one-sided nature of what is called "expert" evidence. Such differences of opinion in cases are only too common, and do not redound to the credit of the medical profession. In India, as our author points out, this is but seldom seen, but in England it cannot well be avoided unless a total change of procedure is made, and medical men are called in not on one side or the other, but as assessors to advise the Judge on professional and technical points. Such expert advice is usual in dealing with difficult nautical cases, and should be recognised in all cases in which medical evidence is of importance. The first chapter deals with the modes of death. We are glad to see that Lt.-Col. Gibbons gives no support to the popular bogey of premature burial. His remarks on the onset of *post mortem* changes and the cooling of the body are admirable, and will be found useful by the Civil Surgeon in India. The statements made are usually supported by the quotation of actual cases in the author's own experience. As regards the question of the rapid formation of adipocere the author accepts the views of Coull Mackenzie (whose name by-the-bye is not always spelt quite the same) which we reproduced in our special Medico-Legal Number in 1902. The advice given on pages 40 and 41 of the work should be studied by every Civil Surgeon in the mofussil.

The chapters on suffocation, hanging and strangulation are very well done, and will be a great help to many Civil Surgeons who have such cases to report upon. The same remark applies to the chapter on drowning.

We read with pleasure and profit the chapter on poisoning in India; it is brimful of the author's own experiences and as such will be found of special interest and value.

The author devotes nearly 30 pages to the all-important question of arsenic poisoning, and this chapter is made still more useful by the detailed examination quoted of the evidence of the Assistant Chemical Examiner in a famous arsenic case tried in Calcutta a few years ago.

It is not necessary for us to go through all the chapters of this volume; but we may add that we should call special attention to the sound views expressed on the subject of insanity and on the criminal responsibility of the insane. The legal doctrine as to capability of knowing the nature of the act is well and clearly discussed, and the English Law on the subject, which is followed in sections 464 and 475 of the Indian Criminal Procedure Code, is well defined.

The appendix, which contains circular 55 on medical evidence and the list of questions which a Magistrate may put to a medical witness, is invaluable, and should especially be studied by Assistant Surgeons and Civil Hospital Assistants, who have constantly to appear in the Courts to answer such questions. This appendix, almost of itself alone, makes the book one which every Civil Surgeon and Assistant Surgeon should possess.

We have expressed ourselves very favourably of this book. It is no compilation, but the work of a man who has vast experience and who has his subject at his fingers' ends.

In another edition we would like to see a few illustrations, and we think that many of the illustrative cases would be more conspicuous if printed in type smaller than that of the general text.

The price of the book is low (Rs. 12-8-0), it is well and clearly printed and can be recommended with confidence to all who have to deal with legal medicine in India.

Insanity in Every-Day Practice.—By E. C. YOUNGER, M.D., D.P.H. Ballière, Tindall & Cox, London, 1904.

WE have frequently called attention to the excellence of the little volumes published in Messrs. Ballière, Tindall & Cox's *Medical Monograph Series.*

The present little book, costing only half a crown, is an admirable review of the subject of insanity from the point of view, not of the specialist, but of the ordinary general practitioner. It consequently does not pretend to do more than discuss the broad outlines of insanity. The general practitioner is brought into contact with lunacy cases in many ways, and will no doubt welcome a brief handbook like this, which he can quickly consult and find guidance in.

Our author gives several definitions of insanity, but wisely advises the medical witness to decline to make any definition, if asked to do so in Court. Under the heading, "causes of insanity:" the various factors, as heredity, sex, age, are discussed, and the useful table which is used by Asylum Superintendents in England and by the Lunacy Commissioners in making out their reports is quoted.

We are accustomed to "temperance" orators quoting formidable statistics that 50 per cent of admissions to asylums are due to drink. Our author believes this statement to be exaggerated. The following carefully sifted figures are quoted from the Lunacy Commissioners' Blue Book for 1902.

PROPORTION OF ADMISSIONS TO ASYLUMS DUE TO DRINK.

	per cent.
Private Asylums, males	18·5, females 8.8.
Pauper Asylums, „	23·8, „ 9·7.

This is serious enough, but shows the exaggeration of the platform orator. Our author believes heredity and drink to be the "two principal causes of insanity, but the influence of the first has been under-rated, and that of the second over-rated."

Other admirable parts of this little book deal with "examination of the patient with a view to certification;" and with the "legal bearings." Part II deals with the various forms of insanity, and the types are distinguished as clearly as possible, and useful descriptions are given of such special states as puerpural, alcoholic, syphilitic insanity, the border-land states and moral insanity.

Upon the whole the little book is one which can be commended, and the Civil Surgeon in India may read it with profit and advantage.

Midwifery for Midwives.—By W. DENISON WIGGINS, M.R.C.S., L.R.C.P., D.P.H. Baillière, Tindall & Cox, London, 1904. Crown 8vo. Pp. XV & 249, 44 illustrations. Price 3/6.

Mr. DENISON WIGGINS is the Assistant Superintendent of the Greenwich Infirmary, and he has written this small handbook with a view to preparing intending midwives for the requirements of the Examining Board authorized by the Midwives Act, 1902. We are glad to find him advising Midwife candidates to qualify as efficient general nurses before taking up the special branch of midwifery, the course for which is all too brief and the sphere too limited. The general nurse who has learnt surgical cleanliness and the implicit carrying out of orders, and who has been trained to observe symptoms, will make a far more reliable and skilled midwife than the woman who is trained for this one subject alone. Chapter IV is concerned with micro-organisms, asepsis and antisepsis. Chapter V deals with general nursing, and gives instructions for personal cleanliness, the giving of enemata, the significance of the pulse, and temperature, the prevention of bedsores. Chapter XXII treats of the urine and its composition, the catheter and washing out the bladder and such ordinary details. In Chapter XXIV are briefly given the preparations for abdominal section, since occasions may arise when the midwife may meet with a case where she will be called upon to prepare for this operation. The rest of the book is concerned with midwifery. The first three chapters describe the anatomy of the female pelvis and genitals the membranes and placenta, and the fœtus Chapters VI to XIV deal with pregnancy labour, its mechanism and variations, and the puerperal state. Then follow three chapters on the infant, its hygiene and diet, artificial feeding, and diseases incident to birth. The remaining chapters are concerned with complications such as hæmorrhage, prolonged labour, inflammatory conditions and eclampsia.

In the appendices are given the rules for the Central Midwives Board and a series of questions from previous examination papers.

It is worth noting that the index does not contain the word "forceps," or "midwivery forceps," and that no instruction is given to the midwife regarding the application of this instrument. This procedure is rightly regarded as within the province of the medical practitioner—male or female. But there are midwives and nurses in our chief presidency cities, and even in the districts, who take a pride in flourishing their midwifery forceps before the patient and her friends, and even of offering them to the practitioner—should the latter have been called in.

The diagrams and illustrations are both numerous and clear, if somewhat rough.

Manual of Surgery.—By ALEXIS THOMPSON, M.D., F.R.C.S. (Ed.); and ALEXANDER MILES, M.D., F.R.C.S. (Ed.). Published by Young J. PENTLAND, Edinburgh and London, 1904.

THIS, the first volume, deals with General Surgery, contains over 750 pages, with 262 wood engravings, which are chiefly original. It is a handy volume, resembling Mr. Pentland's publications of Muir and Ritchie's Bacteriology and Cunningham's Anatomy. The work may be confidently recommended as a reliable guide to the student, in which theoretical points are mostly eliminated, and pathology treated of only in practical bearing on diagnosis and treatment.

After describing in simple language the process of repair, the authors proceed to describe the conditions which interfere with repair, including a concise and clear account of surgical bacteriology. This is followed by a useful chapter on the methods of wound treatment. Next come excellent disquisitions on inflammation and suppuration, and lucid descriptions of sapræmia, septicæmia and pyæmia. The chaotic classification of ulcers, owing to there being no single basis of classification, is neatly circumvented by adopting an arrangement based on their etiology and on their present condition. The clinical division of gangrene into those forms due to interference with the circulation and those due to bacterial infection is also good. After dealing with constitutional conditions such as syphilis and tubercle, the authors pass on to tumours and injuries, and next they consider hæmorrhage, the diseases and injuries of blood-vessels, lymphatics and nerves, skin, muscles and tendons, and bursæ. Then they describe in detail fractures and dislocations, and the diseases of bones and joints.

The volume is very well written by surgeons who have acquired the theory and art of teaching as well as the practical experience and manual dexterity of surgeons in a large medical school and hospital. It is an excellent book which can safely be recommended to the student as a text-book and for the perusal of medical practitioners whose surgical knowledge needs occasional brushing up. It has also the advantage of not being a ponderous tome, but quite a handy little volume, printed on nice paper and in clear type.

CONTINENTAL EYE CLINICS.

(*Continued from page* 153.)

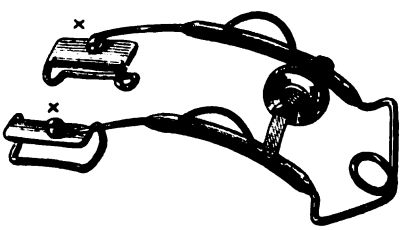
IF an apology is needed for the length of the notes on de Wecker's methods of dealing with cataract, I must plead the enormous reputation and the vast experience of this distinguished teacher, whose writings even at the sunset of his long career command admiration even when one disagrees most with the views he is propounding. With Snellen and Hansen Grut, he is one of the few survivors of the "old brigade" who have done such yeoman service for ophthalmology.

PARIS, *December 8th* and *11th*. Visited the clinique of Professor Lapersonne, in l'Hotel Dieu (the great 'General Hospital' of Paris). The staff consists of the Professor, a Chef-de-clinique, three internes, and six or seven externe assistants; there are over seventy beds, and about 5,000 new out-patients attend yearly. The wards in which recent operation cases are lying, are kept darkened by blinds. Such cases are dressed lying down, and it is characteristic of Lapersonne, that he opens the eye for inspection very slowly, graduating the amount of light admitted as he does so. His minute attention to detail makes his clinic well worth a visit, and in no branch is this more marked than in his measures for the attainment of asepsis. The ordinary cases are marshalled in front of the Professor, after he has finished the recent operation cases; each sits in front of him in turn, and is carefully examined and prescribed for. Lapersonne devotes Tuesdays, Thursdays and Saturdays to operations and in-patients, and the alternate days to out-patients. He operates before visiting the wards.

Antisepsis.—All instruments are well boiled before operation, and scissors, forceps, etc., are invariably passed through a spirit flame before each fresh application to the eye if they are used more than once.

The head and sides of the face are carefully enveloped in aseptic cloths, before the operation commences. The operator and his assistants wash their hands most carefully before each operation, and then rinse them well in perchloride solution.

Cataract.—I witnessed a number of operations. The patient was laid on an operating table, cocaine drops were twice instilled, and the lids and face were very carefully washed first with soap and water, and then with bin iodide solution; a blepharostat was inserted, and the conjunctival sac was freely irrigated with the same antiseptic solution; the blepharostat was not held by any assistant and was left in throughout the whole operation; it had hinged



Pley's Blepharostat.

blades like Pley's instrument (*vide* diagram of latter made by H. Wulfing-Luer, 6 Rue Antoine-Dubois, Paris). Lapersonne makes an incision in the limbus, performs iridectomy with cross-action scissors, lacerates with a cystitome, and

delivers with the aid of a curette and spatula; he now removes the speculum and carefully massages out any remaining cortex; he is most patient while so doing, and waits repeatedly for the chamber to reform; he never introduces an instrument of any kind into the chamber to remove débris. The patient comes on to the table with a nightcap fitted over the back of the head and tied on by strings under the chin; over this, after the application of the dressings, a firm figure-of-eight bandage is bound; both eyes are closed for 4 or 5 days, and the operated one is kept closed a few days longer.

Lapersonne has undertaken comparative series of operations by the combined and simple methods and unhesitatingly declares in favour of the former, which he considers far the safer of the two. Prolapse of the iris after operation is in his opinion a very grave complication. When operating for incomplete cataract, for cataract secondary to intra-ocular disease, or for cataract in subjects whose general health is bad, he advocates and practises the performance of an iridectomy at a preliminary séance; indeed, in any doubtful case, he thinks this the safest method to follow.

One of the cases of extraction, which I witnessed, presented a complication interesting because of its rarity, though presumably a mere coincidence; the patient was an old woman (82 yrs.), and severe epistaxis, the day following operation, caused grave anxiety. I do not know the sequel.

Zonular Cataract.—Lapersonne operates in 4 séances, *viz.*, (1) Preliminary Iridectomy; (2) Linear incision and free laceration (through incision) of capsule with a knife needle, followed 10 days later by (3) Linear incision and evacuation; lastly (4) Discission of the secondary membrane left.

For *Secondary Capsule* he does not operate till 4 months after the original extraction, as he finds the results of early operation non-permanent; though he at times employs discission, he is not greatly satisfied with it, and if it disappoints him, or if he is doubtful of the probable result, he extracts the capsule through a linear incision. I witnessed the extraction of 2 capsules, and in spite of the operations being most skilfully performed, there was a slight escape of vitreous in both.

Lapersonne prefers ablation of the anterior segment, combined with evisceration to enucleation and is opposed to the introduction of any foreign body into the globe.

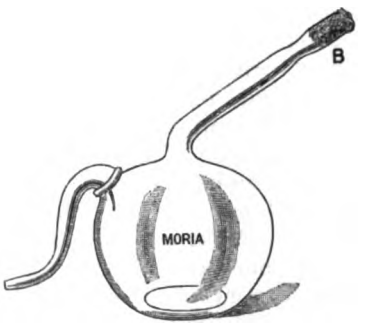
For *Hypopyon Ulcer* he uses the actual cautery.

Glaucoma.—His favorite operation is iridectomy, but in difficult cases he follows de Wecker in performing an anterior sclerotomy first, and following it up with an iridectomy four days later. He draws special attention to the connection existing between the cardiovascular changes, which result from high arterial tension, and the onset of glaucoma.

In a case of acute glaucomo in a girl of 22, Lapersonne obtained most excellent results by resorting to ablation of both superior cervical ganglia after iridectomy had failed to arrest the disease. A free incision along the posterior border of the Sterno-mastoid gave access to the 'paquet vasculo-nerveux,' which was easily followed up till the ganglion was found. Both ganglia were thoroughly removed. The operation was performed on May 31, 1902, and four months later the marked improvement which followed the operation had been maintained. Not only was the local condition of the eye (one was hopelessly lost before the case came under observation) improved to such an extent that the patient was "working without fatigue," but the general arterial tension which had been very high before operation, and which was presumably causally related to the glaucoma, was markedly favourably modified. It seems not unlikely that 'sympathectomy', as he calls it, may have a rôle to play in the future.

Granular Ophthalmia.—For entropion the favourite operation in this clinique is Arlt's.

Dacruocystitis.—Lapersonne considers that the great majority of these cases are tubercular in origin. In the presence of suppuration or of fistula, he ablates the sac, and is satisfied with the result of the operation.



Borax' Dropper Bottle.

The dainty little dropper, figured above is used at all operations; it is capable of sterilisation by boiling, and it works by the heat of the hand. The arm is closed by the thumb and a plug of cotton wool at B protects the drops from infection therefrom.

Paris, December 12th.—I visited the clinique of Professor Trousseau; it is known as the Hospice de Quinze-vingts, and was originally built to hold 300 blind people, but Gambetta founded a chair of ophthalmology in the institution, and induced the railways of France to transport thither free of charge all indigent persons suffering from eye disease. The result is that the clinique is very large. It has a staff of four surgeons and a number of assistants. I saw the operations of Trousseau and of two other surgeons.

Trousseau operated on four senile cataracts, one soft cataract, one secondary capsule, and a glaucomatous eye, and in not one case did he insert a speculum or use fixation forceps, nor did he accept any help from an assistant beyond occasionally having the lower lid depressed. For *cataract*, he told the patient to look down, raised the upper lid with his left hand, thrust the knife into the cornea carrying it in deeply to freely lacerate the capsule with its point, made a counter-puncture, and cut out; he next delivered the lens and cortex by digital pressure through the two lids, and massaged the iris back by the same means; both eyes were then closed by pads and a figure-of-eight bandage. It will be seen that *the only instrument he used* (exclusive of his fingers) *was a knife*. He told me that he aimed at making an incision which should lie just within the limbus, but it was obvious that even his skill was insufficient to enable him to be sure of the exact location of his cut; in three cases out of the four he damaged the iris with his knife. In the case of soft cataract, he plunged a keratome laterally through the cornea into the lens, and evacuated the cortex by the same movement; the manual dexterity displayed was wonderful, but I thought that he again cut the iris, and that the incision was somewhat a matter of chance. Similarly in the other two operations, it appeared that what was gained in brilliancy was lost in accuracy. Professor Trousseau is an operator whose manipulative skill one cannot but admire most sincerely, but to imitate his methods would, in my opinion be to sacrifice precision, while gaining but little in return.

He has two tables in use, and a patient is being prepared on one, whilst Trousseau is operating on the other. All his instruments are soaked for 15 minutes in absolute alcohol and then boiled in water to which some sod. carb. has been added; the patient's face is well washed with a solution of Hyd. Cyanidum, and the conjunctival sac is irrigated with the same fluid.

He invariably performs the simple operation for cataract, *unless there is a cough*; the latter is his one indication for a combined extraction. He admits to 3% of prolapse, which he treats by cauterization (galvanic), and of which he makes very light. He stands in front for the left eye.

The cocaine used is dissolved in distilled water at a strength of 5%, and is applied three or four times, commencing 10 minutes before operation. If the patient is very steady, an extraction lasts about 30 seconds. The patient is kept on his back for three or four days; the first dressing is made on the 3rd day and dressings are exchanged for smoked glasses on the 6th day, when the patient is discharged. Atropine is instilled daily for one month, beginning from the third day.

The rationale of Trousseau's procedure is based on the following contentions;—

(1) that the fewer instruments one uses, the less is the the danger of introducing septic material;

(2) that the speculum inconveniences the patient and favours an escape of vitreous by its pressure and by the difficulty there is in quickly removing it;

(3) that fixation forceps are liable to tear or irritate the conjunctiva and that their pressure on the globe in case of sudden movements of the eye endanger the vitreous body; and

(4) that the patient's efforts assist the operator in fashioning his flap.

It has not been my custom in these notes to offer personal opinions, but rather to state what it has been my privilege to see of the practice of others. In this case, I venture, while leaving the more obvious criticisms of the method to any intelligent reader, to make the following comments;—

(A) That the difficulty experienced, by even so expert an exponent of the method as Trousseau himself, in avoiding contact between the knife and the lids was so obvious as to dispose of the question of a perfect asepsis at once, unless it could be established that the lids and conjunctiva were absolutely sterile—a contention few, if any, would venture on.

(B) that the patients I saw on the table appeared to me to be more nervous than the ordinary patient. It looked as if they felt the loss of the usual measure of restraint which, while impressing on the patient his helplesness, throws him into dependence on the surgeon; one of the patients shot his lens out of the eye at the finish of the section with dangerous rapidity by a sudden squeeze, an eloquent comment on the question of pressure.

(C) that it was obvious that even when the patient looked down, the eye lacked the steady firmness required for a *clean even* incision, and that the precise placing of the cut was far more difficult than it is when the eye is fixed; it is said that Trousseau fixes the eye by the grasp of two fingers, but I can certainly say that if the patient was in the least inclined to be restless, the control, thus claimed, was most insecure, and inefficient; indeed I saw one case finished by the operator cutting right against the conjunctiva of the lid.

I have diverged from my usual custom and offer these comments because, while the method is interesting and Professor Trousseau's skill in executing it is fascinating, I would be very loth to be responsible for any Indian surgeon giving a trial to what I consider to be an unsound procedure.

December 12th—15th.—Visited Professor Abadie's *Clinique*. He has three assistants, and there are about 4,000 O. Ps. yearly. The hospital is an adapted private house, and Abadie works under considerable difficulties. He is well worth meeting, and impresses one strongly as a scientific, thoughtful, honest worker, with large experience. Like all French Ophthalmologists he extends a very kindly welcome to strangers.

He meets with a number of cases of a calcareous deposit on the conjunctiva and cornea, similar to those we see so commonly in ill-nourished natives of India; these are difficult to remove by scraping, but he finds that they yield readily to drug-treatment for gout (colchicum, etc.).

For septic corneal ulcer he uses the galvano-cautery.

For the chroiditis, iritis, and other similar *manifestations of syphilis*, he injects *into the veins* 1 c. grme. of a solution of Hyd. Cyanidum (Hyd. Cyan. 0·50 grme., Aq. dist. 50·0 grmes.). I watched a number of these injections being made, every care was taken to avoid sepsis, the needle being heated in a flame before each injection. The vein was always easily entered, its entry being demonstrated by a flow of blood into the barrel (glass) of the syringe. The patients suffered no pain and no inconvenience. Abadie claims that this method enables him to produce an early and powerful influence on the disease, without risk of salivation or other disagreeable symptoms. The injection is usually given every second day, but in urgent cases it may be used daily.

Granular Ophthalmia.—Old chronic cases are treated by rubbing the everted lids with a solution of Hyd. Cyanid. (1 to 500). More recent cases are submitted to the following operation, for which Abadie claims excellent results. He seizes the lid in the grasp of a fine, long-bladed pair of forceps, and thoroughly everts it so as to fully expose the conjunctiva right up to its reflexion; an incision is made into the conjunctiva just above and parallel to the upper border of the tarsus; the subconjunctival tissue is then freely opened up and thoroughly scraped, but none of it is removed. The powerful hold afforded by the forceps enables this manœuvre to be easily carried out. I am unable to explain the rationale of the method, but independent witnesses attest its value.

Glaucoma.—Abadie attacks the view which traces morbid increases of tension to the 'crowding of the iris' into the angle of the chamber, when the pupil is dilated. He believes that all forms of glaucoma are due to morbid excitation of the vaso-dilator nerves of the eye, and that the difference between the simple and congestive varieties is merely a matter of the channel along which the pathogenic impulses are conveyed. In the simple form we have, according to Abadie, to do with a vaso-dilator stimulation of certain of the sympathetic fibres which help to form the carotid plexus and which pass thence to the ciliary ganglion. In the congestive varieties, on the other hand, it is his opinion that the impulses travel from their bulbar origin along sympathetic fibres which are included in the sheath of the 5th cranial nerves. In support of the latter view he cites the experiments of Hippel and Grünhagen, and finds an analogy between the glaucomatous crises they excited when stimulating the 5th nerve, and the unfortunate incidence of morbid tension in the fellow eye which sometimes follows an iridectomy for glaucoma in the first. He would attribute the antagonistic influences of atropine and eserine, as seen in high tension eyes, wholly to the vaso-dilator and constrictor properties of those drugs.

He advocates iridectomy for the treatment of all congestive cases, for all the forms in fact in which the attacks are intermittent. Even when there is no pain, and when the hyper-tension is not constant, he considers the presence of coloured rings around flames, or of passing obscurations of vision, to be sufficient warrant for the removal of a portion of iris. In performing this operation, he is strongly of opinion, that while it is absolutely necessary to excise the *whole depth* of the membrane, the breadth of the section is a matter of small importance. According to him, a *narrow chink* is all the coloboma needed, and he maintains that if such an aperture fails to arrest the disease, it is in vain to attempt more, as even the total ablation of the iris will be of no avail. From this stand point he proceeds to argue that it is to the section of certain nerve filaments in the iris, and not to any structural alteration of the eye that iridectomy owes its value.

Abadie is no believer in sclerotomy, since he finds its results all too transient. He has entirely abandoned it.

For simple glaucoma he practises the ablation of the superior sympathetic cervical ganglion on both sides, or the resection of the fibres which pass from these ganglia to the carotid plexuses. He, of course, only resorts to this severe measure when drug treatment has failed. Not only does he believe that iridectomy and sclerotomy are useless in the treatment of simple cases of glaucoma, but he is disposed to think that a preliminary iridectomy renders the prognosis after sympathectomy worse than if the iris had been left intact. His results after ablation of the ganglia have been sufficiently gratifying to encourage one to attempt it in cases which progress steadily down-hill in spite of a full exhibition of rational and myotic treatment, but it is still doubtful how far one can expect a *permanent* arrest of the disease to follow what is undoubtedly a severe operation.

Exophthalmic Goitre.—Abadie has for years maintained that this disease is due to a condition of hyper-excitation either of certain vaso-dilator fibres which run in the trunk of the cervical sympathetic, or of the nuclei of origin of those fibres. He describes these nuclei, which preside over vaso-dilatation of the head and neck, as being situated in the medulla and upper part of the cord, lying vertically one above the other. The individual prominence of the symptoms in any one case would depend on the extent to which the different nuclei or fibres are affected. In order to put an end to the morbid hyper-excitation it is not necessary

to resect the whole sympathetic cervical cord, as has been supposed. Abadie finds that simple resection of a portion of the sympathetic trunks including at the most a partial resection of the ganglia indicated, serves fully as well as and is much safer than the more radical operation proposed by Jonnesco. In those cases in which exophthalmos is the most marked sign, and in which the destruction of the uncovered eyes is to be feared, he advises section of the sympathetic trunk between its middle and superior ganglia. When the thyroid symptoms are most in evidence, he would make the section below the middle ganglion, whilst for tachycardia the branches of the inferior ganglion are to be cut. The first-mentioned procedure is far the easiest, and while the second is difficult, the last-named is much more so. Needless to say, operation is reserved for severe cases, which resist treatment by milder means.

Abadie calls in a general surgeon to perform these operations for him, as he naturally considers them outside the Ophthalmologist's range. The following are the steps of the operation for severe exophthalmos. An extensive incision is made along the posterior border of the sternomastoid, and the large vessels and nerves are drawn inwards and forwards. During this step the external jugular vein and branches of the superficial cervical plexus are divided. The sympathetic trunk is seen as a "fine white band, lying on the longus colli, to which it is bound down by the prevertebral aponeurosis." A portion of this cord 3 or 4 cm. in length is resected, together with the lower part of the superior cervical ganglion, and the wound is closed in the usual way. Both sides are operated on at one séance, and the whole procedure takes about 25 minutes. The results of operation have been, so far as his experience goes, uniformly satisfactory, and what is more they have not only been promptly attained, but they have also proved permanent in many cases.

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Major, I.M.S.

Current Literature.

I

SPOTTED FEVER (TICK FEVER) OF THE ROCKY MOUNTAINS; A NEW DISEASE.

BY JOHN F. ANDERSON.

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ETIOLOGY.

1. Geographic Distribution.—*Montana.*—The disease has been known in the valley of the Bitter Root River in Western Montana for about twenty years. It is sharply localized on the west bank of the Ritter Root River, no cases having been known to occur in persons on the east side of the river who had not a short time previously visited the west side. The infected locality extends from Loo Loo to Como, a distance of about 50 miles. Certain places in the valley seem to be more heavily infected than others. Nine cases have also occurred in the canyon of Rock Creek, about 10 miles south of Benito and 20 miles east of the Bitter Root.

This year information was obtained from Dr. L. A. Gates, of Bridger, Mont., about 400 miles east of the Bitter Root, of the prevalence of the disease in that locality. A report of two cases described by him will be seen in the Appendix.

Idaho.—The disease has also been known clinically in Idaho for many years, the first published description having been made by Dr. E E. Maxey, in the "Portland Medical Sentinel" for October, 1899 (1) an unpublished symposium on the disease by various Idaho physicians was made by Major M. W. Wood, U. S Army, 1898, to the Surgeon-General of the Army. In Idaho the disease prevails throughout almost the entire valley of the Snake River, its tributaries, and the foothills of the neighbouring mountains.

Nevada.—I am informed by Major W. R. Kendall, U. S. Army, that the disease also prevails in the valley of the Quinn River in Northern Nevada.

Wyoming.—Cases have been reported this spring at Cody and Meeteetse.

Oregon.—The mild form of the disease has been reported in Eastern Oregon.

2. Climate.—The disease does not prevail south of 40° or north of 47′. It prevails at an average elevation of about 3,000 to 4,000 feet above sea-level.

3. Season.—The disease prevails exclusively in the spring and early summer. In the Bitter Root cases the earliest was March 17th and the latest July 20th.

4. Occupation.—All occupations that cause the person to be exposed to the bite of ticks, such as stockmen, and especially sheep herders, miners, prospectors, lumbermen, ranchmen, and those whose duties take them into the brush, are subject to the disease.

5. Age.—Persons from 15 to 50 years of age more often contract the disease, as during that period they are more actively engaged in outdoor work. The youngest case was 18 months and the eldest 74 years old.

6. Sex.—In 121 cases, 76 were males and 45 females the difference being probably due to the greater liability to exposure of men on account of occupation.

7. The Parasite.—In the spring of 1902 Dr. A. F. Longeway, Secretary of the Montana State Board of Health, engaged the services of Drs. L. B. Wilson and W. M. Chowning, of the University of Minnesota, to investigate the "spotted (tick) fever" then prevailing in the Bitter Root Valley. These gentlemen published the results of their work in the Journal of the American Medical Association, July 19th, 1902, and in the report of the Montana State Board of Health for 1901-2.

Surgeon-General Wyman, of the Marine Hospital Service, detailed Surgeon J. O. Cobb to also investigate the disease, and his report was published in the Public Health Reports, volume 17, No. 33, August 15th, 1902.

The same year Dr. F. F. Wesbrook, of the University of Minnesota, visited Missoula and confirmed the findings of Dr. Wilson and Chowning. His report will be found in the biennial report of the Minnesota State Board of Health for 1901-2.

Wilson and Chowning noticed ovoid intra-corpuscular bodies in stained preparations of the blood from their earlier cases. They did not determine the character or significance of those bodies until they examined the fresh blood of case No. 94, when they found ovoid intra-corpuscular bodies showing amœboid movements. These observations they confirmed in all the later cases which they examined To Wilson and Chowning, then, belongs the credit of discovering a parasite which is *very probably* the cause of spotted (tick) fever.

Parasites in the red-blood cells are rather common in the animal kingdom. The two which I desire to mention especially are those of malaria and of Texas

cattle fever. The parasites found in the red-blood corpuscles of persons suffering from spotted fever apparently lies between these two. Unlike most malarial parasites, it is not pigmented, but, like them, it shows amœboid movements, thus differing from the *Pyrosoma bigeminum*, which is non-pigmented and without motion. Again, one form of the parasite found in spotted fever is arranged in pairs in the red-blood cells, closely resembling the double form of *Pyrosoma bigeminum*.

In my studies upon the cause of spotted (tick) fever I had the opportunity of examining the blood, both fresh and stained, in a number of cases. Two cases were in hospital in Missoula, and daily examinations were made. In the fresh blood a few cells were found to contain parasites. Three forms were seen. The most common was a single ovoid body, refractile, situated within the cell, usually near its edge. When the slide is warmed this body possesses the power of projecting quite rapidly pseudopodia and a slight change of position. This form, which is apparently an early or young form, is about 1·5 to 2 micra in length, and 0·5 to 1 micron in width at its widest part. It closely resembles the earliest intra-corpuscular parasites of æstivo-autumnal malaria.

Another form, not so common, was larger, being about 2 to 2·5 by 1 to 1·5 micra, larger at one end and showing in the larger end a dark granular spot; this was also amœboid.

The third form noted was arranged in pairs, distinctly pyriform, with the smaller end approaching, and in two cases a fine thread uniting the small ends was seen. Motion was not observed in this form, but the spot mentioned in the second form was seen.

Great difficulty was experienced in staining the organism. A number of stains were used, but the most satisfactory results were obtained by the use of Wright's stain, followed by Loeffler's blue. Carbolized Unna's polychrome methylene blue also gave fair results, heat fixation at 120° C for twenty minutes being used. I was unable to find the paired forms in stained preparations, though Drs. Wilson and Chowning informed me that they had no difficulty in doing so. By a reference to Pl. I, figs. 1 and 2, it will be seen that the parasite takes the stain more deeply at one end and is only faintly outlined in its periphery. Sometimes it has only a central stained spot surrounded by a clear unstained space.

The parasites are never found in very large numbers, it being usually necessary to search several fields of the slide to find one. Sometimes they occur in groups, two or three infected cells being found in one field. In both fresh and stained preparations extra-corpuscular bodies closely resembling the small single intra-corpuscular form were seen, I was unable to definitely decide the charcter of these bodies, but am strongly inclined to think that they are the young form of the parasite which has not yet invaded the red cells.

I had the opportunity to examine the fresh and stained blood from cases in the Bitter Root Valley of smallpox, typhoid fever, measles, scarlet fever, rheumatic fever, pneumonia, pernicious anæmia, some surgical cases, and from healthy persons, but did not note in any of them any bodies, either intra or extra-corpuscular, resembling in any way the bodies above described as being found in the fresh and stained blood of persons suffering from spotted (tick) fever.

In the cases of spotted (tick) fever which I had the opportunity of examining I had no great difficulty in finding both in fresh and stained preparations the bodies above described Their constancy in the blood of persons suffering with spotted fever, their persistence for some time in the blood of these persons after recovery, their absence from the blood of persons suffering from other diseases and of healthy persons makes it very probable that they are the cause of the disease, and that one more has been added to the rapidly growing list of diseases of man due to animal parasites.

Cultures were made by Wilson and Chowning and by myself from the blood of patients during life and from the organs and tissues at autopsy, and the only bacterial growth obtained was *Staphylococcus epidermidis albus*, *Staphylococcus pyogenes aureus* and *albus* *Bacillus coli*, and in one case an anærobic spore-bearing organism was obtained from the spleen. No one organism was constant, and from some cases no growth at all was obtained.

8. Method of Infection.—The life history of the organisms of malaria and Texas fever naturally suggested that some insect was concerned in the transmission of the disease. On investigation it was found that the ticks appeared in the valley about the last of February, but were inactive until the middle of March or first of April, the first cases of fever appearing about the last of March. The ticks begin to diminish greatly in number from about June 1st, and after the middle of July very few are seen; the cases of fever also begin to diminish about June 1st, the latest date on which the disease has been known to occur being July 20th.

Mosquitos do not appear in the valley until after the first cases of fever develop, and remain some time after the last cases appear. Bed-bugs and other house insects, I think, were well excluded, by the fact that there has never been known an instance in which two cases occurred the same year in the same house.

On a closer study of the cases of spotted (tick) fever, it was always found that there was a history of tick bites about one week before the onset. In four cases there was a history of a single bite two, three, five, and seven days, respectively, before the initial symptoms. The usual time between the bite and the onset of the fever is about seven days. If the tick transmits the disease, it may be asked, Why do not more persons become infected, and why is the infection confined to the west bank of the Bitter Root River? I think this may be answered by the very obvious fact that the tick is unable to travel any great distance, unless carried on some person or object. Again, it is very unusual for a tick to bite a person and not be discovered in a short while, and the result is the death of the tick. If, as in Texas fever, the development of the parasite takes place in the female tick and the young ticks transmit the infection, the very small number of ticks which escape detection on persons explains the small number of infected ticks. Where do the female ticks get their infection? I examined a recovered case twenty-four days after discharge by the physician, and had no trouble in finding the parasite in the fresh blood. This child had been out of doors for over two weeks, and if a female tick (ticks were quite numerous near the house) had bitten her and escaped destruction the parasites in the blood taken in by the tick would have undergone development and the young ticks, when hatched out, would be ready to infect prospective victims.

While the above facts and conclusions tend strongly to the belief that the ticks are necessary for the transmission of the disease, the actual fact cannot be proved scientifically until carefully controlled experiments are made on non-immune persons.

As many ticks as it was possible to obtain were collected in the Bitter Root Valley; twenty-four, representing what were thought to be different species, were sent to the Hygienic Laboratory of the Service in Washington, D. C., for classification. They were referred by the Director to Dr. Ch. Wardell Stiles, Zoologist of the Laboratory, for determination, and he reports that—

"All of these specimens belong to the genus *Dermacentor*. There is considerable variation among them, but so far as I have been able to make out, this variation does not extend beyond the limits usually found in one and the same species in this group. Most of the material is not in the best condition for determination, but so far as I am able to discover, I can recognize as yet no specific difference between these specimens and *Dermacentor*

reticulatus. I would therefore make the provisional diagnosis of *Dermacentor reticulatus*.

The ticks in box No. 1 have laid numerous eggs, and I have developed the six-legged stage from them. I have now made arrangements to place these young ticks on cattle and develop all of the various stages. With fresh material of this kind I shall be able to determine whether the variations noticed extend beyond the limits of specific value, and also whether there is any reason for me to change my opinion that these represent the species known to zoologists as *Dermacentor reticulatus*."

SYMPTOMS.

Incubation.—This is from three to ten days, usually about seven. For a few days the patient may have chilly sensations, malaise, and nausea; finally there is a distinct chill, and the person takes to bed. There is some pain in the back and head; soreness of the muscles and bones, causing a sensation as if the limbs were in a vise; bowels constipated; tongue with heavy white coat, red edge and tip; conjunctivæ congested, becoming yellowish; urine usually small in amount, with albumin and a few casts; slight bronchitis after a few days; nose bleed, sometimes quite severe, is always present.

Fever.—Before the distinct chill there is little or no fever in the morning, with a slight rise in the afternoon. After the chill there is an abrupt rise, and from then on the fever gradually rises in the evening, with a slight morning remission. The maximum is usually reached on the eight to the twelfth day; then, in a favourable case, gradually falls, becoming normal about the fourteenth to the eighteenth day, usually going to subnormal for a few days. In fatal cases the fever remains high, from 104° to 105° or 106°, and the morning remissions are very slight or not present.

The pulse appears out of all proportion to the temperature, usually running from 110 to 140, a pulse of 120 being not unusual with a temperature of 102°. It is rather thready, though sometimes full and strong, occasionally dicrotic in the first week. Red-blood counts show a progressive decrease in red cells, but as soon as the temperature becomes normal an increase begins. The white blood corpuscles are increased in number, varying from 8,000 to 12,000. A differential count in two cases gave an average of—

	Per cent.
Polymorphonuclear leucocytes	77·7
Large mononuclear leucocytes	11·4
Small lymphocytes	10·0
Eosinophiles	·9
Total ...	100·0

This shows as its most interesting feature an increase in the large mononuclears.

There was steady, but never very rapid, decrease in the percentage of hæmoglobin, one case going as low as 50 per cent.

The blood failed at all times to agglutinate *bacillus typhosus*.

Fresh and stained blood showed the three forms of parasites described under etiology.*

The Eruption.—The eruption appears usually on the third day, first on the wrists and ankles, then on arms, legs, forehead, back, chest, and last and least, on the abdomen. It is never very abundant on the abdomen, but the other portions of the body in some cases are literally covered by the eruption.

At first the spots are of a bright-red colour, macular at all times, from a pin point to a split pea in size. At first, they disappear readily on pressure and return quickly, but if the case is a severe one, they soon become darker and in some cases are almost purple. From about the sixth to the tenth day of the disease, they fail to disappear on pressure, and are distinctly petechial in character. In favourable cases, about the fourteenth day they begin to lose their petechial character and disappear slowly on pressure. In some cases the eruption consists of small, brownish spots, giving a turkey-egg appearance.

As the fever declines the eruption begins to fade; but a slight return of fever or a free perspiration will cause it to show distinctly. I am informed that, following a warm bath in a case ten months recovered, the spots showed distinctly. I have seen them in a case twenty-four days after discharge.

When convalescence is well advanced desquamation begins and extends over the entire body. In very severe cases there may be gangrene of the fingers or toes, and still more frequently of the skin of the scrotum and penis. The skin is always jaundiced to a greater or less degree. This is usually first noticed in the conjunctivæ, the vessels of which are congested from the outset.

Digestive System.—The tongue at first has a heavy whitish coat with red edge and tip; later the coat becomes dark brown and the teeth are covered with sordes. At first there may be a little nausea, but the appetite is often good throughout the first week. In fatal cases nausea becomes more presistent during the second week and lasts until the end. Constipation is present throughout the course of the attack. Tympanites is never excessive; gurgling in right iliac fossa occasionally. The liver is usually moderately enlarged. The spleen is enlarged early, and may extend 1 or 2 inches below the costal margin.

Urinary System.—The urine is decreased to about one-half its normal amount for the twenty-four hours; small amount of albumin in all cases examined; granular, hyaline, and epithelial casts.

Respiratory System.—The respiratory rate is always increased, usually varying from 26 to 40 per minute, in some cases reaching 50 to 60; regular but often shallow. In the second week there is always a slight bronchitis. Lobar pneumonia is a frequent complication in fatal cases. Epistaxis is usually seen from the end of the first week.

Nervous System.—Pain in head and back is usually severe during the first week. Soreness of the muscles and bones causes the patient to change position often in the endeavour to find a comfortable posture. The muscular soreness is often very severe, even in mild cases, and lasts until recovery. The mind is usually clear, even in severe cases, until within a few hours of the end. Pupils react normally to light and distance; no opisthotomus or other irritative symptoms.

The following summary of the *post-mortem* appearances of the disease are based on the findings in seven cases from the Bitter Root Valley.

Rigor mortis.—Usually intense and appears early.

Skin.—Jaundiced, sometimes deeply. One or more wounds apparently caused by tick bites usually present. The skin has a marbled appearance. On the non-dependent parts of the body spots, petechial in character, from bright red to dark purple in colour, and from 1 to 3 cm. in diameter; most abundant on wrists, ankles, arms, and back. The capillaries are congested; minute extravasation in the rete extending into the stratum mucosum.

Nervous system.—The cerebral and spinal meninges are normal except for slight hypostatic congestion. No increase in fluid. The brain and spinal substance normal.

Respiratory organs.—Pleuræ normal and do not contain excess of fluid. Lungs show hypostatic congestion; occasionally pneumonia.

Circulatory system.—Pericardium normal. A few small petechial hæmorrhages under the epicardium over left ventricle were constantly found. The heart muscle is flabby, softened, and pale. Right heart full of blood; left, contracted and empty. The nuclei are faintly stained; fibres granular and fragmented.

* The average normal red-blood count at this ele 3,500 feet) gives over 5,500,000.

Digestive organs.—Stomach normal. Small and large intestines normal in appearance throughout; Peyer's patches rather pale in colour Mesenteric and retro-peritoneal glands not enlarged. *Spleen usually dark purple in colour, soft, diffluent, and from three to four times its normal weight;* vessels engorged with blood; many mononuclear leucocytes containing from one to four red corpuscles; no free pigment. *Liver enlarged,* fatty, and in portions areas outlined by bile pigment; sections usually show an advanced degree of fatty infiltration; bile capillaries full. Pancreas about twice its normal weight.

Kidneys.—Enlarged; capsule usually not adherent. Small subcapsular hæmorrhages on ventral surface. On section, congested and swollen cortex; pyramids well outlined and deep red colour. Small hæmorrhages in pelvis. Microscopically there are minute extravasations of blood in cortex and under the capsule; veins filled with blood. Nuclei of the convoluted tubules stain poorly; cells granular and in some places detached; newly formed casts in tubules. Bladder normal and usually with small amount of dark urine.

Prognosis.—Of 121 cases which have occurred in or near the Bitter Root Valley, 84 died, giving a case mortality of about 70 per cent The mortality varies within narrow limits from year to year, some years as many as 90 per cent. of those attacked dying. The cases which have occurred near Bridger, Mont., show about the same mortality. Death usually occurs between the sixth and the twelfth day. The abundance of the eruption apparently bears no relation to the severity of the disease. The disease in Nevada and Idaho is not nearly as fatal as in Montana. Dr. Maxey says of the Idaho cases:

The prognosis in spotted fever is, as a rule, very favourable if the patient is transferred to the lower valleys where he can have home comforts and proper care. The disease seems to be more malignant in some localities than it is in others, and in one year than in another.

Diagnosis.—Cases occurring in the infected localities and presenting a history of tick bites, chill, pain in head and back, muscular soreness, constipation, macular eruption, first on the wrists and ankles, appearing on the third day of illness, becoming petechial in character, do not present much difficulty in diagnosing spotted (tick) fever. A blood examination should be made in all suspicious cases. There are five diseases which might cause some difficulty in differentiating them from spotted fever.

Dengue.—This is a disease of tropical and sub-tropical countries, whereas spotted fever occurs at an elevation of from 3,000 to 4,000 feet above sea-level. The swollen joints, pleomorphic eruption over the joints, never petechial, apyretic period, and short course of the disease would differentiate it from spotted fever.

Cerebro-Spinal Meningitis.—The stiffness of the muscles of the neck, photophobia, sensitiveness to sudden noises headache, and rigidity of the muscles of the back and neck, with the not altogether constant irregularly situated rash, should not cause much trouble.

Peliosis Rheumatica.—In this disease the sore throat, multiple arthritis with purpura and urticaria, and comparative rarity of the disease, offer a sufficiently distinct clinical picture.

Typhoid Fever.—Clinically this disease closely resembles spotted fever but the rose spots appearing first on the abdomen – papular in character—diarrhœa, Widal reaction, and presence of the typhoid bacilli in cultures from the blood of typhoid fever, and the presence of parasites in the red blood cells of spotted fever, suffice to separate distinctly the two diseases.

Spotted (tick) fever, I think, more closely resembles typhus fever than any other disease, and cases of typhus fever occurring in a locality in which spotted fever prevails would, without a blood examination and close edside observation, cause much trouble in diagnosis. In typhus we have the longer period of incubation, absence of a history of tick bites, the eruption which first appears on the abdomen and chest. its intensely contagious character, especially prevalent in the winter months, not limited to a short time in the spring, and marked nervous symptoms. As before mentioned, two cases of spotted fever have never been known to occur in the same family the same seasons conclusively showing the non-contagious character of the disease.

Treatment.—Until the past season the treatment of the disease has been purely symptomatic, but after the discovery of the parasite Dr. Wilson and the writer suggested the use of quinine in large doses, preferably hypodermatically. In five cases in which it was used systematically and in large doses the results were most happy, all recovering. Five cases which did not have the treatment died. Of course, ten cases is too small a number on which to base very positive conclusions, but I hope that the use of quinine will be followed in the future treatment of the disease.

Quinine bimuriate, 1 gram, should be given hypodermatically every six hours. If there is great objection to the use of the needle, the sulphate, 1 gram, every four hours may be given by mouth; but the irritable condition of the stomach at times may prevent. The use of quinine should be begun as soon as the diagnosis is made and persisted with in decreasing doses as convalescence begins.

Some of the valley physicians seemed to fear that quinine depressed the heart and caused nervous symptoms; but I am of the opinion that the great good the drug does more than counterbalances these effects. I strongly advise the early and continuous use of large doses of quinine.

Some physicians speak well of calcium sulphide, and others of creosote.

The heart should be supported with strychnine, whisky, or other appropriate cardiac stimulants.

For the severe pain in the head and back during the first week Dover's powders or morphine sulphate may be used. The patient should be encouraged to drink large quantities of water to flush out the kidneys. For the fever, warm sponge baths, or packs are useful and refreshing to the patient. After a bath the spots lose their dark colour and become much brighter. The room should be kept dark and as free from noise as possible.

Milk, butter-milk, broths, soft eggs, and soft toast may all be allowed. The whisky may be administered in an eggnog.

As soon as a person is bitten by a tick the insect should be removed and the place cauterized with 95 per cent carbolic acid. There is sometimes difficulty in removing the tick; but by applying ammonia, turpentine, kerosene, or carbolized vaseline it can usually be detached without trouble.

The disease, considered from a public-health standpoint, is of much greater importance than was thought until recently. On account of its high mortality in the Bitter Root district attention has been focussed there, but on investigation the disease was found to be spread over a large area. The mortality, for some unknown reason, is greatly higher in Montana than in the other States. The disease is not much dreaded in Idaho or in Nevada, but the terror it excites in the Bitter Root Valley is great. If, as seems very probable and almost proved, the tick is the means by which the disease is spread, the question of the prevention of the disease resolves itself into the destruction of the ticks. This is an almost impossible task over such a large area, especially of such varied topography. When conditions will permit, burning the undergrowth and stubble will be an effective method for the destruction of ticks. This may be done either in the early fall or preferably in the early spring, when the ticks are just beginning to move about.

II

MEDICINE.

IN the *Journal of the American Medical Association* for July 11th, 1903, are several articles on typhoid and other fevers.

Dr. R. M. Harbin gives a clinical observation of *ninety cases* of typhoid fever with *four deaths*, after commenting on the death-rate from this disease in Georgia. The death-rate per 1,000 deaths from typhoid fever is in Georgia 58, that of the coloured race being 46 and of the whites 71. He continues,—"The death-rate from typhoid in the south is startling and claims about an equal number of deaths as tuberculosis, and well water is probably the source of infection. The average age at death is 28·8 years." The diagnosis of the cases was clinical. He considers that no routine drug treatment of the disease has any specific value, but that turpentine relieves the intestinal symptoms better than any other drug. Looking upon gastro-intestinal catarrh with hyperplasia and great reduction of all the digestive fluids as being the point which should have the greatest influence in guiding treatment, and considering diarrhœa as the "effort of Nature to throw off what the intestines cannot digest," he begins treatment by imposing a fast of from 24 to 48 hours followed by a very restricted diet of "broths of beef, chicken, mutton, oysters, etc., coffee, cocoa, egg albumin, peptonoids, etc., in prescribed amounts." To these are added gelatin "which adds to the relish of the various fluids, lessens the nitrogenous waste from the system and prevents hæmorrhage." Milk is absolutely prohibited except when diluted two to five times in coffee, cocoa, broths and hot water to render the formation of curd formation light. As improvement advances he gives more nourishment, but while considering that recrudescences are nearly always due to dietetic errors and that solid food is most dangerous, yet points out that fasting in the late and convalescent stages will cause fever from inanition.

In the same number is a record of 529 cases of typhoid fever seen at Denver, a height of 5,000 feet, by Drs. Hall and Cooper. The total deaths were 77 or 14·5%; 124 of these cases were treated by "tubbing at a temperature of 70, or as near that as could be used, whenever the two-hourly temperature rose to 102·5. Alcohol was given just previous if the heart was weakened perceptibly." The mortality was 14·5%, or exactly the average for the whole series. In the rest of the cases the temperature was controlled by sponging or by an electric fan bath. They conclude: "We are not convinced of the advisability of feeding with solid food before the fifth or seventh day after the temperature reaches normal, except in cases with exceptionally mild attacks and with clean tongue."

A third paper in the same number is entitled *Continued Fever, neither Malarial nor Typhoid*, by Dr. Happel. His belief is stated at the beginning of the paper thus:—"Our medical brethren in the north, as a rule, contend that every fever is either typhoid or malarial, while in the south many of us are sure that we have a third fever, which merits a careful study, the mortality of which is so slight that opportunities for *post-mortem* study have been almost *nil*." "A sufficient number of examinations have been made to show that it does not respond to Widal's test, nor does it show the presence of the plasmodium malariæ" These tests have been made, he states, by able pathologists.

The fever, of which he has treated about one hundred cases, but has never been able to verify his diagnosis on account of the recovery of all the cases, lasts from three to five weeks. His description can hardly be condensed and is as follows:—

"These cases have not, then, been ushered in, as a rule, abruptly by a chill, but have had usually for a week prodromes of malaise, then rigors, sometimes a slight chill, followed by a slight rise in temperature, which does not generally attain its maximum for from three days to a week. While this fever presents marked remissions for the first week, the remissions are not so decided in the second week, but are more so in the last week, amounting to intermissions with profuse sweatings. The chills or cold stages are accompanied by aching of sometimes one set of muscles and sometimes in all, resembling in that respect la grippe, after a day or two all pain ceases, and the patient complains of nothing. The remissions in this type of fever vary from one to four in 24 hours....There is no nausea and vomiting; never bilious vomiting, no jaundice, no clay-coloured stools, no diarrhœa, and if any departure from the normal in this respect, constipation; no tympanites unless it be due to some imprudence in eating; no tenderness over the abdomen; no rose-coloured spots; no marked enlargement of the spleen or liver, unless there has been a history of malaria preceding; no anorexia, but in many cases a desire for food all through the sickness; no broad dry flabby tongue, with its yellow pasty covering, but, as a rule, a tongue nearly normal in every respect, and when coated it is thin, of a light colour. We have in none of these cases the pointed narrow dry fissured tongue with its red edges and dry, coated, and frequently cracked centre. The digestion is rarely impaired for food suitable for the sick. There is no mental hebetude; in fact, generally the brain is not affected at all, and ordinary business matters could be attended to by many of these patients with their usual business acumen. We never have any low muttering delirium. One of the most marked peculiarities of this fever is the disproportion between the pulse-rate and the temperature. The ratio is frequently inverse, the pulse being at from normal to ninety, with a temperature of from 103° to 105°F or even higher, and the same may be said to be true of the temperature of any exposed part of the body. The hand applied to the pulse and then to the forehead would lead anyone not using a thermometer to say that there was perfect freedom from fever.

As regards treatment he says, "as soon as satisfied that the cases are not malarial, which should be determined in four days, quinine should be abandoned, or used as a tonic in 3-gr. doses. I have obtained the best results by alternating the following prescriptions for an adult:—

℞
Guaiacol Carb. ... 3ii
Sodae Salicyl ... 3vi
Bismuth Lact. ... ℥iv
One teaspoonful every four hours.

℞
Tr. Iodi ... 3ss
Liq. Potas. Arsenit. ... ♏i
Aquæ ... ℥iv
One teaspoonful every four hours, alternately with the first.

The temperature is reduced by the free use of tepid or cold water, allowing the patient to choose. The diet is liquid or semi-solid, butter milk being preferred to anything else when the patient can use it."

C. A. L.

EXTRACTS FROM FOREIGN JOURNALS.

III.

The Differentiation of Human Blood I.—How many Civil Surgeons in India have had to reply "I cannot say" to the question, "Was the blood which you found on the clothes, weapon, &c., human blood?" and how many criminals have got off on the plea that the blood was that of a goat or other mammal, we know not; but we are glad to learn that at last a definite test has been devised by which one may say with certainty that this is human, while that is other mammalian blood. Working in Strassmann's Public Health Laboratory in

Berlin Hugo Marx and Ernst Ehrenrooth have found that they got positive results in the following very various cases :—

I. Fluid Blood—fresh or decomposed—of man, cattle, horse, sheep, hog, dog, horse, white mouse, and rabbit.

II. Dried Blood.—(*a*) on linen, 3 years old—horse, cattle, dog.

(*b*) On linen, wood, and blotting paper in mass.	Human, 2 weeks to 2 years old.
(*c*) On linen, sand, wood and blotting paper in mass.	Rabbit, hog, cattle, sheep, 2 weeks to 1 year old.

The method employed by them is this : On a microscope slide is put a little of the blood to be examined, and to this are added a few drops of a 6% salt solution as a solvent, the resulting solution being of a dark brownish red colour. The finger of the examiner having been pricked, a drop of blood is conveyed from it on a glass rod to the solution on the slide, with which it is mixed by careful stirring for five to six seconds. Then the preparation is covered with a cover glass, and examined for the next 15 minutes under low and high powers. The fresher the strange blood, and the more concentrated the solution thereof, the more rapidly is the reaction brought about : when blood, a few months old, is examined, the reaction begins in a few seconds and becomes minute by minute more marked ; while with blood only a few weeks old, the reaction begins as soon as the finger-blood is brought in contact with the blood solution.

Or, one may, instead of covering the preparation, spread it out over the slide after two to three minutes, and let it dry, by which means one obtains a beautiful permanent preparation, which is useful for purposes of demonstration.

The reaction consists in a prompt clumping together of the xanthocytes of the finger-blood, with some hæmolysis, by a solution of a mammalian blood, not human ; while with human blood-solution the xanthocytes show but little clumping, and one can always distinguish the individual cells.

The blood of the monkey acts somewhat like human blood on the finger-blood, with this difference, however, which is of capital importance, that while the xanthocytes become crenated with human blood, they become polygonal with simian blood, and show no crenation. Undoubtedly there is a great future for the Marx Ehrenrooth Test in the Indian Courts.—[*Muenchener med. Wochenschr, No.* 7 *of* 1904.]

The Differentiation of Human Blood. II.—While the Marx-Ehrenrooth Test enables us to say definitely that we have to deal with the blood of man or some other mammal (for, of course, as far as possible, microscopic examination of the suspected blood will be made to determine the shape of the corpuscles, and their nucleation or its absence), we are enabled to determine to what mammal other than man the blood belongs, and, in the case of its being human blood, to verify the results of our test, by using the Bordet-Uhlenhuth method of serum diagnosis, which is based on the fact, first observed by Bordet, and afterwards elaborated by Uhlenhuth, that if an animal (A) have injected into it repeatedly the blood serum of another animal (B) this animal's serum (A) will gradually develop the power of causing a precipitate in the serum of the other animal (B), and that this power will exist only with reference to animal B's species. It may be of service to detail the method employed by Hauser of Erlangen, who has much medico-legal work to do, to obtain a serum for human blood, as those who wish to obtain sera for other bloods can do so by following the method given.

The blood is obtained from placentæ, or cadavera, in which, latter case, tubercular subjects are carefully excluded, as the rabbits are easily infected, and it is, of course, in the observer's interest to have his rabbits live a long time. The blood thus obtained is received in sterilised glass beakers, and these are corked with cotton wool plugs—thus one obtains a clear serum which by the addition of a little chloroform may be kept on ice for months. Even from cases of septic peritonitis a sterile serum may be obtained by canulisation of the jugular vein, and draining away of the blood thereby.

The rabbits receive an injection twice a week of this serum, up to 24 cc., the injections being given hypodermically, and intraperitoneally, until within 21 days about 150 cc. have been given, all that is noticed being a slight loss of weight at the commencement of the treatment. Hauser believes that it is better to hasten slowly—so probably 20 cc. would be enough, four weeks being thus required. He is of opinion that what is wanted is a serum which, when mixed with thirty times its volume of a solution of human blood, will, at incubation temperature, cause the resulting mixture to become cloudy within 30 minutes, a woolly precipitate being thrown down soon after this cloudiness appears, while mixtures of the serum with solutions of blood other than human, and solutions of blood unmixed with serum remain clear for 6 to 8 hours, and even after 24 hours show only the slightest trace of deposit.

The rabbit which gives such a serum is kept alive and from time to time bled from the ear, the injections of human serum being continued at longer intervals, so as to keep up the standard of the rabbits serum.

The blood taken from the ear is stored in Ziemke's tubes, which are corked with cotton wool and kept in a cool place. The tubes must be quite unused, as those once used cannot be cleaned sufficiently to fit them for use again. After 24 hours we have a clear serum which may be removed by means of a pipette. As a rule one obtains two tubefuls of blood, which yield about 2 cc. of serum, a quantity more than sufficient for any case. Other Ziemke's tubes are then filled to a certain height—duly measured—with the solution of blood to be tested, and with solutions of other bloods—and to each tube's contents is added enough serum to make the proportion 1-30 of blood-solution. Or better still, as being a more exact and less expensive method, one proceeds as follows : a series of capillary tubes is filled with solutions of various bloods—the variety being noted on each tube—to a certain height, which is marked off on each tube. The end of each tube is then carefully dried with tissue paper, and then the tubes are laid on a glass plate, so that their lower ends project over its edge. Then with a sterilised pipette a drop of serum is brought on to a carefully cleaned microscope glass-slide, which is then canted so that the drop of serum may run towards its edge, which is then brought in contact with the free end of one of the capillary tubes. Thus the serum-drop is sucked up into the tube, and comes in contact with the blood-solution contained in it, without any air-bubble being interposed. The end of the capillary tube is then carefully dried and, the tube being held upright, corked with a morsel of *plastilin* (possibly paraffin would do as well), and placed in a glass beaker whose bottom is covered with a layer of cotton wool. For each capillary tube of blood-solution a fresh drop of serum on a fresh glass slide is required. Soon one observes a ring of haziness at the junction of the serum and the solution of human blood [had the serum been that of a rabbit treated with sheep's blood, the haziness would be seen in the tube containing a solution of sheep's blood], and this haziness increases, extending upwards into the blood-solution, and gradually giving place to a woolly deposit, while the upper portion of the blood solution remains clear. The blood solutions are always made with 6% salt solution, and to guard against the eye being deceived by a haziness of the glass of the tubes, a magnifying glass is used for examining their contents. It will be seen that the fact of the serum used being a 1 to 30 power serum is of no importance when capillary tubes are used, as it is only a small portion of it which comes in contact with the blood-

solution, shaking being carefully avoided.—[*Muenchener med. Wochenschr, No. 7 of* 1904.]

Most of our readers will be inclined to agree with Uhlenhuth and Ziemke, that the special work of obtaining sera for the diagnosis of blood should be undertaken by a special institution. Probably the Laboratories at Kasauli and Parel are alone in this country fitted for the work. But there is no reason why the Marx-Ehrenrooth method should not be followed in every district, whose Civil Surgeon belongs to the I. M. S. at any rate.

W. D. S.

Correspondence.

"CIRCUMCISION: MIDWIVES AND THE 'MINOR OPERATION.'"

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Captain Leicester's letter on the above subject shows that he has not quite appreciated the reason why objections were raised. My letter was not written to protest against the prepuce being drawn back when it can be—and should be of course—so that the glans penis may be washed, smegma removed, adhesions separated, but to protest against what I—and others—consider to be a 'futile and unscientific proceeding' carried out in children who have tight foreskins by nurses whose surgical training is not enough to tell them when to desist, and who as a matter of fact do not desist without a great struggle from their efforts.

It was because I have had practical experience of the midwife performing this 'minor operation' that I protested against it. The hard struggle referred to may not take place in the Eden Hospital, but I can assure Captain Leicester that in mofussil practice it not unfrequently does, and when his experience has extended to the mofussil I believe he will find that what we object to is a fairly common occurrence. Probably many medical men do not know of this practice because the nurse does it on her own responsibility when she washes the child after the doctor has left the room or the house

May one ask what Captain Leicester does when the nurse desists from her efforts and sends for him? Does he renew the attempt or at once resort to circumcision? Teaching midwives to tie the cord is on quite a different footing as inability to do it may imperil life. My point is that if the prepuce is too tight for micturition or to be drawn back with comparative ease, no amount of force will curl the phimosis, and surgical aid is necessary. It comes to this—what is phimosis? The answer I maintain should rest with the doctor, not the nurse. He should satisfy himself as regards this before handing the baby over to the nurse. When there is no doctor the midwife should be instructed, after satisfying herself that the child can pass water, to leave matters alone until a doctor can be consulted.

SURGEON.

"A QUESTION OF PRIORITY."

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—In April's number of the *Indian Medical Gazette*, you state on page 148 that "the priority of the discovery of the bodies [Leishman's] will undoubtedly rest with Surgeon-Major D. D. Cunningham, I.M.S., etc."

I may point out that there is no similarity whatsoever between Piroplasma donovani and the bodies found by Cunningham (called by Firth, Sporozoa furunculosa, *British Medical Journal*, 10th January, 1891, page 60).

This is a clear case of not verifying one's references. The Editor of the *Scientific Memoirs*, New Series, No. 8, is also guilty of this mistake.

MADRAS, *14th April*, 1904. } C. DONOVAN, *Major, I. M. S.*

[WE followed the authority of the Editor of *Scientific Memoirs*, No. 8.—ED., *I. M. G.*]

Service Notes.

THE provision of large sums of money in the Financial Statement for 1904-05 and in the various Provincial Budgets for the increased pay of I. M. S. officers is an indication that this long-looked-for change is about to happen. Before these lines are in print we hope that the announcement will be made. In more than one quarter we hear of men talking of not coming into Civil employ, or of reverting to Military. Such a state of affairs, we trust, shall not continue long.

SIR T. J. GALLWEY, M.D., K.C.M.G., C.B., has gone on eight months' leave. He is looked upon by many as the coming D. G. at the War Office, or whatever new Board has taken the place of that much abused institution.

CLUB gossip, both in London and in India, has credited Sir Fred. Treves with the strange ambition of becoming the Head of the Army Medical Service. How that may be we do not know, but there can be no doubt that in the Advisory Board the R. A. M. Corps possesses a strong and influential support, and the Board will not hesitate to push the interests of the corps possibly further than would be desired by the rank and file of I. M. S. officers at any rate.

SOME months ago we commented on the difficulty that I. M. S. officers had in obtaining the necessary certificates to enable them to go up for that very useful diploma, the D.P.H. We understand that a R.A.M.C. officer can qualify for the practical work certificate by working under one of the Army Sanitary officers. This being so, we should like to see it recognised that six months' work as a Deputy Sanitary Commissioner, under the Provincial Sanitary Commissioners, should equally qualify. This, we hear, has been done in the case of one officer lately, but it should be officially recognised and published. Such a training is far more useful to an I. M. S. officer than going around with the Health Officer of any city at home. Every assistance should be given to make I. M. S. Officers take these diplomas in Public Health.

Apropos of the D. P. H., we hope to see I. M. S. men also going up for the newly-instituted Diploma in Tropical Medicine at Cambridge. This is an admirably arranged examination, and if the conditions of the attendance on courses of lectures, &c., are not made too prohibitive for men on their infrequent and hard earned furlough, we would like to see a lot of men going up for it. The fee for examination is six guineas.

THE Liverpool University, with their admirable School of Tropical Medicine, are not to be behind Cambridge and have also instituted a Diploma in Tropical Medicine (D. T. M.).

AN excellent portrait of Major Ronald Ross, F.R.S., appeared in a recent issue of the *Journal of Tropical Medicine*.

COLONEL B. O'BRIEN, I.M.S., has had to go home, seriously ill.

COLONEL H. MCKAY, I.M.S., succeeded Colonel O'Brien as P. M. O., Presidency District, Calcutta, when the latter went to U. P. as I.-G. C. Hospitals.

IN reply to a correspondent we quote from an old edition of the Official Army List the ages, or rather dates of attaining the age of 60 and 55 years of a number of senior officers in the Bengal Medical Service.

Sir Benjamin Franklin was 60 on 30th April 1904.
Colonel Joubert will be 60 on 2nd March 1906.
Surgeon-General Scott Reid will be 60 on 4th April 1908.
Colonel Bookey will be 60 on 10th December 1906.
Colonel J. McConaghey will be 56 on 8th January 1905.
Colonel M. D. Moriarty will be 56 on 29th January 1905.
Colonel B. O'Brien was 55 on 26th May 1903.
Colonel D. Wilkie will be 55 on 27th June 1904.
Colonel H. K. McKay, C.I.E., will be 55 on 4th December 1905.
Lieutenant-Colonel Swaine will be 55 on 20th April 1906.
Colonel S. H. Browne, C.I.E., will be 55 on 19th January 1905.
Colonel Bomford, C.I.E., will be 55 on 19th July 1906.
Lieutenant-Colonel Ranking will be 55 on 7th January 1907.
Lieutenant-Colonel R. D. Murray will be 55 on 30th August 1906.
Lieutenant-Colonel R. Macrae will be 55 on 26th May 1905.
Lieutenant-Colonel T. E. L. Bate, C.I.E., will be 55 on 29th July 1907.
Lieutenant-Colonel Pat. A. Weir will be 55 on 4th June 1906.
Lieutenant-Colonel J. Lewtas will be 55 on 15th December 1906.
Colonel H. Hamilton will be 55 on 7th April 1906.

Lieutenant-Colonel C. H. Beatson will be 55 on 27th March 1906.

The dates of birth of officers seems to have disappeared from the ever-increasing in bulk—Official Army List.

AFTER the acting Surgeon-General, Madras, the next officers on the *Civil* List in Madras are Lieutenant-Colonel W. G. King, C.I.E., the well-known Sanitary Commissioner, born 4th December 1851, entered the service 31st March 1874; Lieutenant-Colonel W. O'Hara, Inspector-General of Prisons, born 30th January 1852, entered 30th September 1874; Lieutenant-Colonel A. J. Sturmer, I.M.S., born 1st February 1851, entered 31st March 1875; Lieutenant-Colonel John Maitland, M.D., our co-Editor, and Principal of the Medical College, Madras, born 1st December 1852, entered 31st March 1876; Lieutenant-Colonel W. A. Lee, I.M.S., born 13th August 1854, and entered the service 30th September 1876.

THE following officers in Civil Medical employ in Madras are also on leave, besides Surgeon-General Sinclair, Lieutenant-Colonel H. Thomson, 21 months' leave up to 2nd March 1905; Captain T. H. Foulkes, I.M.S., one year's furlough; Captain E. M. Illington, two years' combined leave up to 9th July 1905; Captain H. Kirkpatrick, combined leave up to 19th August 1904; Captain A. Chalmers, I.M.S., granted 8 months' leave (*m. c.*) to Europe.

CAPTAIN T. H. DELANY, I.M.S., has beer appointed Civil Surgeon of Durbhunga, Captain Rait, I.M.S., of Chapra, and Captain W. V. Coppinger, I.M.S., of Jessore, during the month of March.

CAPTAIN L. T. R. HUTCHINSON, M.D., I.M.S., Professor of Physiology, Grant Medical College, Bombay, has been elected Honorary Secretary to the flourishing Bombay Medical and Physical Society, *vice* Major C. H. L. Meyer, I.M.S.

CAPTAIN F. D. S. FAYRER, I.M.S., is now Personal Assis tant to the Surgeon-General, Madras.

THE leave granted to Surgeon-General D. Sinclair, C.S.I, is for 6½ months, and will terminate on 11th October 1904.

COLONEL W. R. BROWNE, M.D., who acts as Surgeon-General, Madras, was born on 23rd May 1850, and entered the service on 1st April 1873.

COLONEL P. H. BENSON, M.D., I.M.S., who goes from Mysore to act as P. M. O., Madras, was born on 1st February 1852, and entered the service on 31st March 1874.

THE leave granted to Major S. H. Henderson, I.M.S., Superintendent, Central Prison, Agra, is cancelled in *U. P. Gazette* of 9th April.

CAPTAIN P. K. CHITALE is appointed Civil Surgeon, Betul, C. P.

IT is said that the pay of the Professors in the Lahore Medical College is to be raised to the level of those in the Calcutta Medical College.

LIEUTENANT-COLONEL W. MACPHERSON, C.M.G., R.A.M.C., has been sent to the seat of war to study the medical arrangements of the Japanese Army.

ON his return from furlough Major A. E. Roberts, M.B., I.M.S., is appointed to be Statistical Officer to the Government of India in the Medical and Sanitary Departments.

DR. C. C. CALEB, Professor of Botany, Lahore, is granted 3 months' furlough.

LIEUTENANT C. B. MCCONAGHY, I.M.S. (Bombay), is appointed provisionally an Agency Surgeon, 2nd class, and posted as Civil Surgeon at Wana.

LIEUTENANT W. C. ROSS, I.M.S., is appointed to the medical charge of the Wing 8th Rajputs, and Lieutenant C. Seymour, I.M.S., to the officiating medical charge of the 2-2nd Gurkha Rifles, *vice* Major F. Wyville-Thomson, I.M.S., granted furlough.

MAJOR B. C. OLDHAM, I.M.S., acts as Civil Surgeon of Chittagong, *vice* Major Jordan, I.M.S., gone on furlough

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THE services of Lieutenant A. W. Greig, I.M.S., and of Lieutenant J. E. Clements, I.M.S., are placed at the disposal of the United Provinces for employment in the Jail Department.

MAJOR W. E. JENNINGS, I.M.S., has been permitted to return to duty in Bombay within the period of his leave.

MAJOR ANDREW BUCHANAN, I.M.S., is allowed 21 months' combined leave from 15th April 1904, and Captain P. K. Chitale, I.M.S., is appointed to act as Civil Surgeon of Betul, C. P.

HONORARY CAPTAIN J. W. HOGAN, I.S.M.D., is granted three months' privilege leave.

A NEW post of Inspector-General of Jails has been recently created as a separate appointment in the Central Provinces, and Major Banatvala, I.M.S., has been appointed to it.

MAJOR S. H. HENDERSON, I.M.S., Superintendent of the Central Jail, Agra, has been granted six months' combined leave.

CAPTAIN T. HUNTER, I.M.S., is appointed Superintendent, Central Prison, Farrakhabad, in addition to his duties as Civil Surgeon, *vice* Lieutenant-Colonel R. R. Weir, I.M.S., promoted to act for Major Mactaggart, I.M.S., as Inspector-General of Prisons, U. P. A. and O.

THE services of Captain A. Miller, I.M.S., Madras, were recently placed at the disposal of the Government of India.

THE following Assistant Surgeons, I. S. M. D., have been awarded "Silver Medals for long service and good conduct":—H. W. Foscholo, G. R. Haines, R. T. Murphy, Lieutenant A. D'Silva, W. D. Busher, C. R. Tunnicliffe, A. Greenwood, A. A. Cotton, P. Victor, F. F. Bedell, R. Corridon, A. D. Cotton, A. R. Paterson, A. Luke, G. O. Weston and R. F. H. Hankins.

THE following has appeared in Bengal Command Orders of 17th March 1904:—

211. SANITATION.—With reference to Command Order No. 613 of 1902, it has been brought to notice that, as the system of digging up the ground round cook-houses, latrines, lavatories, etc., has not been found to be entirely satisfactory, it is to be discontinued as a general practice. In those stations where, in the opinion of the medical authorities, special conditions are held to make this procedure desirable, it will be within the discretion of the officer commanding the station to have it carried out under the conditions previously prescribed.

THE boon of combined leave has been applied to officers in Military employ, hence the following Bengal Command Order:—

215. FURLOUGH AND LEAVE—COMBINED LEAVE.—With reference to Command Order No. 1022 of 1903 and India Army Order No. 64, dated 1st February 1904, it is notified that officers taking leave on private affairs under Article 724, Army Regulations, India, Volume I, Part I, may combine with it any privilege leave to their credit, provided the *combined leave* does not exceed eight months. Privilege leave so combined will not reckon against the aggregate of eight months' leave during tenure admissible under Article 724, Army Regulations, India, Volume I, Part I.

2. Command Order No. 173, dated 3rd March 1904, is cancelled.

216. FURLOUGH AND LEAVE—COMBINED LEAVE.—Applications for combined leave under India Army Order 64 of 1904 must show the number of days *privilege* leave which the applicant desires to combine with general leave.

CAPTAIN N. S. WELLS, I.M.S., is appointed, with effect from 5th January 1904, to be Deputy Sanitary Commissioner, Western Bengal Circle.

CAPTAIN E. R. NEWMAN, I.M.S., acts as Civil Surgeon of Hazaribagh during the deputation of Colonel Macrae, I.M.S.

ON return from leave Major W. G. Jennings, I.M.S., was appointed to act for Lieutenant-Colonel J. Crimmin, V.C., as Health Officer of the Port of Bombay.

CAPTAIN A. MILLER, M.B., I.M.S. (Madras), is appointed to act as Chemical Examiner, Punjab, during the deputation of Lieutenant-Colonel D. St. J. D. Grant, I.M.S., to Bengal.

COLONEL J. MCCONAGHEY, M.D., I.M.S., takes combined leave for 8 months, and Colonel G. Bomford, M.D., C.I.E., I.M.S., acts for him as I. G. C. H., Punjab.

MAJOR F. J. DRURY, M.B., I.M.S., again officiates as Principal, Professor of Medicine, and First Physician, Medical College, Calcutta, *vice* Colonel Bomford, and Captain L. Rogers, M.D., F.R.C.S., I.M.S., acts again as Professor of Pathology in the Calcutta Medical College.

LIEUTENANT-COLONEL F. F. PERRY, F.R.C.S., I.M.S., Principal and Professor of Surgery, Medical College, Lahore, is granted furlough for three months from 1st April.

THE services of Colonel D. Wilkie, M.B., I.M.S., now Sanitary Commissioner and P. M. O., Assam, are permanently placed at the disposal of H. E. the Commander-in-Chief, with effect from 2nd April.

THE undermentioned officers who were appointed Lieutenants on probation for the Indian Medical Service, having completed a course of instruction at the Medical Staff College and being reported qualified, have been finally admitted to the service, their commissions being dated as below:—

1st September 1902.

Frank Powell Connor (Bengal) to rank after Lieutenant Pridham and before Lieutenant O'Leary.
George Harold Lawson Whale (Punjab) to rank after Lieutenant H. C. Brown and before Lieutenant Lauddie.

31st August 1903.

Robert Kelsall, M.B. (Bengal).
John Hay Burgess, M.B. (Bengal).
John McCallum Anderson Macmillan, M.B. (Punjab).
William Edward James Tuohy (Bombay).
Terence Francis Owens (Bombay).
Richard Francis Steel, M.B. (Bombay).
George Francis Innes Harkness (Bombay).
Arthur Charles Ingram, M.B. (Madras).
Gordon William Maconachie, M.B. (Madras).
Ernest William Charles Bradfield, M.B. (Madras).
Alexander William Montgomery Harvey, M.B. (Madras).
Charles Isherwood Brierly (Madras).
John Brown Dalzell Hunter, M.B. (Madras).
Edward Temple Harris (Madras).

LIEUTENANT F. T. THOMPSON, I.M.S., assumed charge of the medical duties of the Tochi Valley on 3rd March, relieving Captain A. B. FRY, I.M.S.

CAPTAIN F. N. WINDSOR, I.M.S., acts as Government Analyst and Bacteriologist, U. P. A. & O., *vice* Mr. E. H. Hankin, granted leave.

CAPTAIN J. C. S. OXLEY, I.M.S., is appointed Civil Surgeon of Seoni, C. P.

CAPTAIN P. K. CHITALE, I.M.S., acted for some time as special Plague Officer at Nagpur.

THE services of Captain N. R. J. Rainier, I.M.S., and Captain A. M. Fleming, I.M.S., are placed permanently at the disposal of the Government of the Central Provinces.

ON his return from furlough Major A. G. Hendley, I.M.S., was appointed Civil Surgeon, Nimar, C.P.

ON his return from furlough the services of Major A. E. ROBERTS, I.M.S., are replaced at the disposal of the Government of India, Home Department.

LIEUTENANT C. A. GOURLAY, I.M.S., is appointed Civil Surgeon of Manipur in addition to his military duties.

COMMAND LABORATORY.—It is notified for information that the Command Laboratory is established at Naini Tal, and that officers of the Royal Army Medical Corps and Indian Medical Service who wish during their leave to carry on laboratory work in tropical and preventive medicine, can do so in this laboratory, as far as the accommodation admits.

They should, in the first instance, communicate with the Command Sanitary Officer, who will give them all the assistance in his power.

LIEUTENANT C. A. GOURLAY, I.M.S., has passed the Lower Standard in Urdu.

MAJOR W. D. SUTHERLAND, I.M.S., is placed upon special duty at Pachmarhi from 1st April to end of June 1904.

CAPTAIN W. M. PEARSON, I.M.S., is appointed to the executive and medical charge of the Central Jail, Nagpur, C. P.

ON the departure of Colonel M. D. Moriarty, I.M.S., on combined leave for 8 months, Lieutenant-Colonel Roderick Macrae, I.M.S., Civil Surgeon of Hazaribagh, has gone to the Central Provinces as Administrative Medical Officer. Colonel Macrae had 29 years' service on 1st April 1904.

LIEUTENANT-COLONEL R. D. MURRAY, M.B., I.M.S., also receives promotion, as he has gone to the United Provinces to act instead of Colonel O'Brien, I.M.S., pending the return of Colonel Joubert, I.M.S.

MAJOR R. BIRD, I.M.S., M.D., F.R.C.S., who has been acting as Surgeon to the Viceroy, has been selected by His Excellency Lord Curzon to go to Kabul to attend the Amir, who recently injured his left hand in an accident. Major Bird was expected in Calcutta in the beginning of May to act as Professor of Surgery in the Medical College during the absence on deputation of Lieutenant-Colonel R. D. Murray, I.M.S. We understand that Captain Thurston, I.M.S., F.R.C.S., will temporarily hold the appointment, pending Major Bird's return from Kabul.

WE are glad to hear that the medical arrangements of the Tibet Mission are working well, and extract the following from a "special correspondent's" account, dated 3rd April, to his newspaper:—

"The treatment of the wounded at the recent fighting at Hot Springs and Guru attracts special attention to the medical arrangements of the Mission and escort. The arrangements are under the supervision of Colonel L. A. Waddell, C.I.E., the administrative medical officer. A considerable medical establishment is necessary to provide for the contingencies of battle, and also to combat the disease and accidents incidental to military force, with its hosts of followers, engaged in road making, and the large army of several thousand transport coolies and mule-drivers employed in pushing up food and other supplies from Silliguri through the tropical Teesta Valley across the most difficult and inhospitable mountains in the world for a distance of over 150 miles, particularly in winter when the climate is for the most part Arctic, inducing especially pneumonia and frost-bite. Up to the present the daily sick list has averaged about 100 fighting men and twice as many followers.

"The medical establishment up to the present consists of 16 executive medical officers, 31 assistant surgeons and hospital assistants, a large staff of nursing orderlies and hospital assistants, with ambulance, transport, tentage, stores, comforts, and other paraphernalia of hospitals in the field. From the base hospital at Silliguri, whence the invalids are sent back to India, all the way up to the front where the mission is at present located, there has been established at each chief stage a section of a medical hospital, and at the smaller intervening posts a hospital assistant with medicines. At each of these stages hospital huts are now being built to replace the tents in view of the onset of the tropical rains in the lower valleys, to afford better protection against the cold and snow of the higher tracts, and better shelter by the way for the sick and wounded invalids proceeding down to the base.

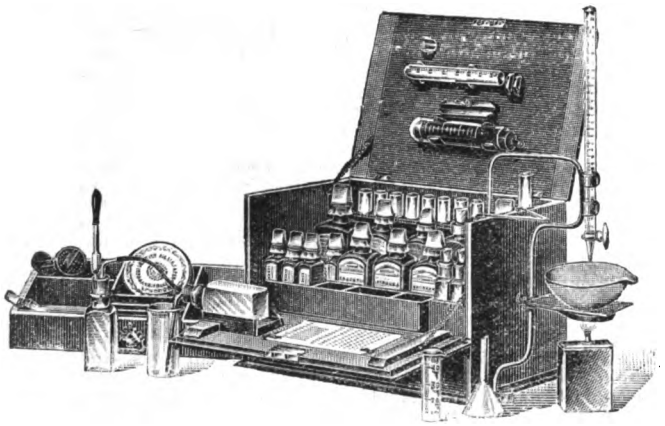
"The ambulance transport forms a host of followers in itself. In addition to the eight stretchers per regiment, there are about fifty doolies each carried by six bearers, also ambulance chairs, riding ponies, and for the cart road along the Teesta Valley over a dozen bullock-tongas. As the Indian dooly-bearers were not considering suitable for carrying work in the cold and at such excessive altitudes, some 300 Tibetan dandy-wallas and Sikhimese coolies were engaged in place of Kahars. Although these uncouth and turbulent mountaineers have not proved altogether a success and have deserted in considerable numbers those who now remain are certainly inured to the Arctic cold of these upper regions and ever so much sturdier porters than the Indian Kuhars. So far they have not carried out their threat to desert in the event of hostilities with their kinsmen of Tibet.

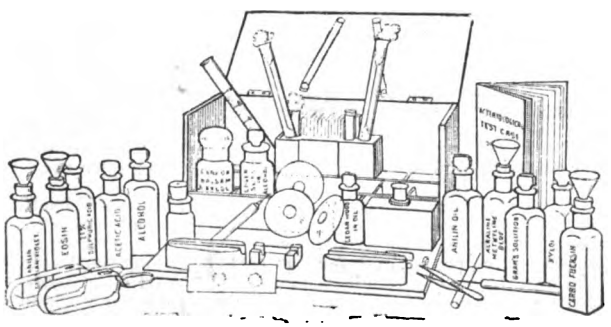
"Our medical arrangements not only provided for our own sick and casualties, but also as a civilised power for medical aid to the Tibetans and to their wounded in the event of fighting. For this the military medical authorities sanctioned an extra supply of drugs and appliances, so that at the action at Guru after our own wounded had been attended to, our medical officers were able to render much help to the enemy's wounded; many of the dying received water or brandy, or had their pain eased by morphia, while about 180 of the wounded, after being dressed, were carried in our doolies and otherwise from the battlefield to Tuna and Guru villages, so as to be near our hospitals in order to receive further treatment. In this humane work General Macdonald has taken a keen interest, providing transport and some food when it could ill be spared, and visiting wounded Tibetans in their temporary hospitals outside our camp.

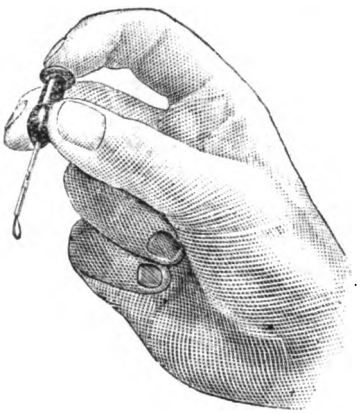
"The excellence of these arrangements reflects the greatest credit on Colonel Waddell and his excutive staff."

THERAPEUTIC NOTES AND PREPARATIONS.

WE have received a large number of samples of drugs and preparations from the well-known Manufacturing Chemist, Mr. W. Martindale, of New Cavendish Street, W. Among these the following articles are worthy of being brought to the notice of the profession in India, *e.g.*, COMPRESSED MOSS. This forms a most absorbent surgical dressing, absorbing, it is said, twenty times its own weight of moisture. It is supplied in several forms, the cheapest being the "Hagedorn" at 1*s.* per lb., the gauze-covered form is more fragile and costs 1*s.* 6*d.* per lb. Loose "broken" moss can also he supplied at 9*d.* per lb., the same substance has been made up into "Hygienic towels" for use of ladies. For large quantities special quotations are made. The same firm have on the market antiseptic **Adrenalin solution** (1 in 1000) in small convenient capsules containing each about ten minims. This method prevents the oxidation of the solutions which is apt to happen when it is kept in bottles. Another ingenious preparation of the same firm are the **sterules**, or sterile capsules of Eye Drops always sterile and always ready. All Surgeons recognise the difficulty of keeping eye drops sterile. We give an illustration of Martindale's **Complete Urine test case**, which contains the reagents for







the detection of a quantitive examination of urine for albumen, glucose and urea and other clinical tests. It is sold complete in locked case for 50*s.* Mr. Martindale also has a useful and complete **Bacteriogical test case** which is worthy of attention.

Just now the most fashionable drug is **Adrenalin**, the active principle of suprarenal capsule, first isolated by the eminent Japanese Chemist Takamine. Messrs. Parke, Davis & Co.'s Simla Branch of the well-known American firm, are selling a solution of this, 1 in 1000. Our readers may remember that a year ago we called attention to the use of this preparation in reducing enlargement of the spleen, and more recently we have read an enthusiastic account of its value in advanced cases of Plague. In hæmorrhages of various kinds Adrenalin is much used at present.

We may call attention to the admirable case of **Lithotrity Instruments**, introduced by Messrs. Arnold & Co. of West Smithfield. The surgical instruments made by this firm are well-known, and their name is a guarantee of good workmanship. It is hardly necessary to direct attention to Messrs. Burroughs, Wellcome, and Co.'s **Cascara Tabloids**. They are very reliable, and effective.

Pearson's **Antiseptic**, and Pearson's **Renine**, the latter a natural mineral water, have recently become well known. Renine is markedly diuretic, the antiseptic is non-poisonous, and is a deodoriser as well as a germicide.

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will **receive 25 Reprints gratis**, if requested.

Communications on Editorial Matters, **Articles, Letters and Books for Review** should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscriptions to the Indian Medical Gazette, Rs. 12, *including postage, in India. Rs.* 14, *including postage abroad.*

BOOKS, REPORTS, &c., RECEIVED.

Sanitary Commissioner's Report, India.
Report of the N.-W. Frontier Province.
Indian Electricity Acts.
New Sydenham Society's Atlas. 2 vols.
Insanity. Ballière, Tindall & Cox.
Every-day Bacteriology. Ballière, Tindall & Cox.
Disease of Heart and Lungs (Pentland).
Gibbons' Medical Jurisprudence. Allen & Co.
Surgical Notes by Nicolas Senn, Chicago.

ACKNOWLEDGMENTS, COMMUNICATIONS RECEIVED.

Major D. M. Moir, I.M.S., Calcutta; Major Donovan, I.M.S., Madras; Major Fearnside, I.M.S., Vellore; Major Maynard, I.M.S., Darjeeling; Capt. S. P. James, I.M.S., Simla; Major R. Elliot, I.M.S., Madras; Messrs. Burroughs, Wellcome & Co., London; Capt. Lindesay, I.M.S., Comilla; Capt. L. Rogers, I.M.S., Calcutta; Major Andrew Buchanan, I.M.S., Betul; Capt. Clayton Lane, I.M.S., Calcutta; Secretary, Bombay Medical and Physical Society.

Original Articles.

AN OUTBREAK OF TRUE BERI-BERI IN AN ASSAM JAIL.

BY CAMPBELL DYKES, M.B. (LOND.),

CAPTAIN, I.M.S.

THE climate and physical configuration of Assam resemble so closely those of Burma and the political connection between them on several occasions before our occupation of the Assam Valley was from time to time so close that it is matter for some surprise that a disease prevailing so extensively, as does beri-beri in Burma, does not appear to have been introduced into Assam. Any such introduction, if it ever occurred, has been on so small a scale or the circumstances were so unfavourable to its spread that it has escaped recognition. Moreover, the opening out of tea gardens and the consequent importation of a numerous foreign labour force introduced an unfortunate confusion of nomenclature. These new and unnatural social conditions brought into prominent notice a heterogeneous group of diseases all characterised by anæmia, which prevailed extensively amongst the new and unacclimatised population living as they were in unaccustomed surroundings and under, to them, irksome conditions of discipline and labour. This group of diseases, of which anchylostomiasis and malarial cachexia are the most important, became known by the name of "beri-beri," following the example of Ceylon, where similar social conditions had, one may suppose, produced similar results. Hence for many years "beri-beri," or its synonym "anæmia of coolies," occupied an important place in the vital statistics of the Assam Valley, and obscured the older use of the name "beri-beri" to express an endemic form of multiple neuritis. A record in Assam of "beri-beri" unqualified by any explanatory synonym is therefore more likely to refer to some form of anæmia than to a case of endemic multiple neuritis. Although there may have been cases of true beri-beri reported, I do not know of a record of any local outbreak. Therefore a short note on a small outbreak which occurred in the Gauhati Jail between August and October 1902 may not be devoid of interest.

The first case was an elderly man admitted to hospital on August 13th, who died on the 17th, with sign of cardiac dilatation—venous engorgement, practical suppression of urine and pulmonary œdema. On *post-mortem* examination the heart and kidneys appeared healthy, and no cause for the cardiac dilatation could be found save a very slight degree of pulmonary emphysema affecting only the anterior borders of the lungs, apparently much too slight to have caused such rapidly fatal results. The urine at a time when only two or three ounces were passed in the twenty-four hours was, curiously enough, free from albumen.

This example of what Schenbe describes as the acute cardiac or pernicious form of beri-beri remained a puzzle till cleared up by the recognition of the second case which occurred in a young Garo. He was being treated for dysentery at the time the first case died, and a few days sufficed to cure the dysentery. But by that time he was observed to be suffering from slight anasarca and scanty urine. By the 2nd September there was great dilatation of the heart, and the anasarca was especially marked at the root of the neck to such a degree indeed as to obstruct deglutition. No knee-jerks could be obtained. The urine was nearly suppressed. Death occurred on the 8th September. The *post-mortem* showed great general subcutaneous œdema fluid in all the serious sacs, with cardiac dilatation and a few small ulcers in the rectum. The abdominal organs were all engorged with blood and the lungs œdematous.

The third case was in some ways the most typical. It was more chronic and showed successively the œdematous and atrophic type. He complained on admission (1st September) of slight fever (to 101°). The feet were œdematous and the urine diminished to 12 oz. in the 24 hours. From September 6th to 17th improvement occurred, the urine averaged 32 oz. in the 24 hours, but no knee-jerks were obtained. On the 19th a relapse occurred, the urine again diminishing, and the œdema increasing with a slight rise of 60 to 99. Marked epigastric pulsation appeared, and for the first time sensation was found to be deficient on the dorsum of the right foot and front of the right leg. The pain of pin prick was delayed, and in places the head could not be distinguished from the point of a pin. On the left foot and leg there was a less degree of delay and blunting of sensation. The legs were crossed only with difficulty. From the 19th to 24th September the urine averaged only 10 oz. in the 24 hours and on one occasion fell to 5 oz. The evening temperature range was between 99° and 100°. On the 25th there was marked tenderness of the muscles of the legs and forearms and the cardiac dulness was increased in all directions. A basal systolic murmur appeared. No hydro-thorax and no ascites could be detected. On October 1st the upper half of the body was much more œdematous than the lower and ascites appeared. From the 9th October the urine began to increase and no rise of temperature occurred; muscular tenderness diminished. But as the œdema subsided marked muscular wasting of the forearm and legs became evident. Recovery was very gradual. Six months later the muscles were still wasted and the patellar tendon tap threw the vastus internus into chronic spasm without producing a normal response.

The fourth case admitted on September 12th with slight anasarca improved so much that within a few days he was unfortunately discharged from hospital. His knee-jerks were present. On October 18th he was readmitted. No knee-jerks were obtained and sensation was absent over a considerable portion of the front of the legs and dorsal surface of the hands and forearms. Later patches of anæsthesia appeared even on the soles of the feet. Eventually præcordial pain and dilatation of the heart with a mitral systolic murmur developed with great diminution of urine. Death occurred on November 27th. The *post-mortem* appearances were similar to those of Case (2).

The fifth case was admitted with slight œdema of the feet and over the sacrum and absent knee-jerks, but the most marked symptoms were weakness of the legs, a peculiar gait and slight Romberg's symptom. There was doubtful blunting of sensation of shins. After being under observation for two months and-a-half he was released on expiry of sentence. The gait was much improved, but the other symptoms persisted.

The sixth case was admitted on September 23rd with increased knee-jerks, which, in the course of three days, disappeared. The legs were weak and could not be crossed without assistance. Five days later the heart became dilated and death occurred on October 1st.

The seventh case also admitted on September 23rd with absent knee-jerk and œdema. He also died of cardiac dilatation with great dyspnœa and obstinate vomiting on October 25th.

The eighth case, admitted on 2nd October with slight œdema, some cardiac dilatation and absent knee-jerks, was only under observation for eight days before his sentence expired.

The ninth case was one of the acute cardiac variety like the first and died within three days.

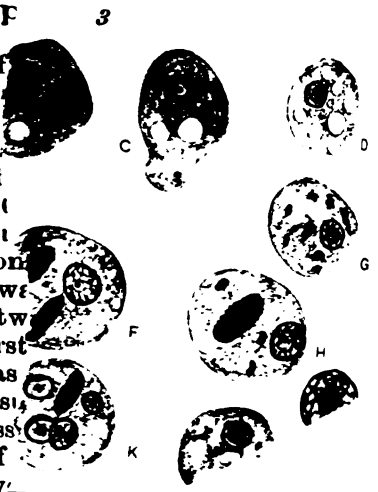
The tenth case was admitted on 28th October complaining of loss of strength in lower limbs and of sudden contractions of muscles of the thighs. On examination the knee-jerks were brisk. There was slight anæsthesia over patches of the inner aspect of both calves. On attempting to rise from bed a sudden contraction was produced in the hamstring muscles, which threw him down. There was slight pretibial œdema. On November 3rd the anæsthesia of the pretibial and inner aspect of the legs was complete—there was also slight anæsthesia of forearms and hands (extensor surface). On November 15th the knee-jerks had disappeared; there was some tenderness of the calf muscles. The area and degree of anæsthesia had diminished. On December 4th there was slight ascites and œdema of the abdominal walls. On the 6th the urine (not previously much reduced in amount) suddenly rose to 60—70 oz. in the 24 hours and concurrently the œdema and ascites disappeared. On the 11th he was released on expiry of sentence.

With regard to individual symp[toms] two points are noteworthy—

(1) The absence of any trace of [pain] even when the daily secretion [of urine] ounces or even to the point of pra[ctical anu]ria sion, was noted in cases 1, 2, 3, 4 [and 10].

(2) An early and fleeting accent[uation of] knee-jerk was noted in cases 4, [and 10] which the reflex disappeared under

(3) Extremely sudden fluctuation[s in] tent and degree of anæsthesia w[ere noted in] cases 4 and 10. In the former, betw[een] 18th, when loss of sensation was first [noted] the 28th, when the maximum was [reached] anæsthesia had spread from the dorsu[m of] foot and front of the left leg success[ively] right foot and leg, to the dorsum of [the left] and portions of the forearm, the tw[o] digital spaces of the right hand, t[he] interdigital space and ulnar border [of the] finger, the whole extent or surface [of] the left forearm, the dorsal surface of the outer two toes of the left foot and small portions of the sole. The greater part of this extensive anæsthesia cleared up in about two days, in spite of an increase in the severity of the cardiac symptoms, and on the last day of life anæsthesia was practically confined to the pretibial areas.



In case 10 the anæsthesia never reached the same pitch, either in area or intensity, but, after persisting for a couple of weeks in both legs and forearms, disappeared in the course of a comparatively few days, so that on release only the left calf shewed patches of anæsthesia.

The investigation of sensation was confined to testing the ability to distinguish the head from the point of a pin and the acuity of the perception of the pain of a pin-prick. Both these cases showed for a few days patches of absolute analgesia. It is interesting to note that in case 10 the sensory loss occurred before, and reached its maximum just when, the knee-jerks disappeared. This case also displayed the curious phenomenon of spasm of the hamstring muscles, which I have not seen described in this disease.

(4) Pyrexia preceded the onset of symptoms of beri-beri in case 6, who, from 1st to 8th September, was in hospital with irregular fever, which was supposed to be malarial, but did not yield to quinine. Case 3 also complained first of fever, but in his case œdema was present from the time he first came under observation in September 1st. It may, however, be remarked that in this case a second bout of fever on 19th September ushered in an aggravation of the other symptoms. Both the fever and the aggravation of the heart symptoms lasted till October 6th, from which date the temperature fell and the other symptoms also began to improve.

(5) As regards the œdema—this shewed a preference for the root of the neck and the angle of the jaw in cases 2 and 3, for the presternal region for some time in case 4, and for

the dorsum of the hands in case 10, and for a while the abdominal cavity and abdominal wall. In all these, however, there was more or less dropsy of the feet, in the erect, and of the back and sacrum, in the recumbent, position. In all the *post-mortems* marked pericardial effusion was formed, usually with fluid in one or more of the other serous cavities.

It is worth mentioning that Case 2 suffered in the month of May from a painless chronic non-inflammatory effusion into the right knee-joint, which lasted about a month and did not re-act to any treatment. In June a precisely similar condition affected the left knee. No cause was discovered to account for the effusion, and it is possible that it may have been of atrophoneurotic character. It preceded definite symptoms of beri-beri, however, by nearly two months.

In none of the cases did anæmia play any part, except perhaps in case 2, in whom also a few ankylostoma were found *post-mortem*; and in only one case did the spleen show signs of old malarial infection.

Of the *post-mortem* signs, dilatation of the heart, especially of the right side, pericardial effusion and œdema of the lungs were constant. The blood was in all the fatal cases markedly fluid. In two cases (2 and 6) there were a few small ulcers in the large intestine.

Six deaths out of these ten cases is a heavy mortality. Especially as of the remainder only one was known to have recovered—the other three being released with symptoms still persisting. No doubt other mild cases escaped recognition—two indeed were under observation, whose symptoms though suspicious were not marked enough to allow of their being reported as beri-beri. But with all allowances, the fatality is greater than seems usual in large series of cases.

As regards the existing cause of the outbreak nothing could be proved. The shortest period of confinement in the jail, which was followed by the development of the disease, was two months in case 8. Case 9 had been in this jail for three months, all the others for over six months, up to as long as nine years in one case.

FURTHER NOTES ON THE CULTIVATION OF THE BACILLUS LEPRÆ AND THE TREATMENT OF LEPROSY BY THE INJECTIONS OF A LEPROLIN MANUFACTURED FROM CULTURES.

BY E. R. ROST,
CAPTAIN, I.M.S.,
General Hospital, Rangoon.

(*Continued from p.* 169.)

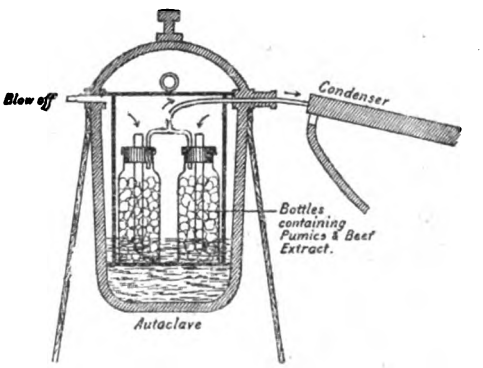
THE method of preparing the distilled nutrient medium has been improved, thus rendering the cultivation of the bacillus lepræ in this medium much more potent for the preparation of leprolin.

Small pieces of pumice stone are washed and dried in the sun, and then made to absorb beef extract; they are then placed in bottles having a wide central tube leading to the bottom, and an outlet tube at the top.

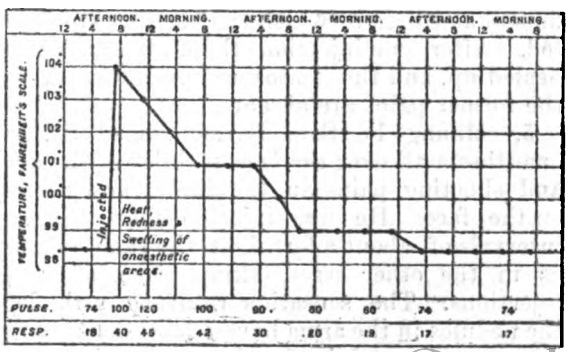
The bottles are placed inside the autoclave, and the tubes from the top of the bottles led out from the autoclave through the valve or blow-off openings, and on to the condenser. By this means the superheated steam passes through the bottles and acting on the heated beef extract in the pumice, carries over to the condenser more nutrient value out of the beef extract, all salts and non-volatile substances being left behind in the bottles. The nutrient fluid is collected at the end of the condenser in sterilized Pasteur flasks and inoculated, when cool, from cultures of leprosy.

The flasks are then allowed to incubate at 37 C. for a period of one month to six weeks and examined, when they should present a turbid appearance and a stringy white deposit, which on being shaken up forms stringy, white, curly, heavy cloudiness in the flasks.

They are then passed through a sterilized Pasteur filter and again re-filtered through fresh sterilized filters, and then reduced to about one tenth the original bulk, by exhaustion over sulphuric acid in a vacuum; the fluid is then mixed with an equal quantity of glycerine and kept in an ice box until required for use.



SECTION THROUGH AUTOCLAVE SHOWING ARRANGEMENT FOR MANUFACTURE OF NUTRIENT MEDIUM FOR GROWING BACILLUS LEPRÆ.



TEMPERATURE CHART OF A CASE OF LEPROSY AFTER INJECTION OF 20c.c. OF LEPROLIN IN THE RIGHT BUTTOCK.

10 c.c. of such a leprolin will cause a violent reaction in a case of leprosy, the temperature rising to 104° F., and the patches becoming red, hot, and swollen.

Thirty-five cases of leprosy have now been injected with leprolion, and the extract from the notes of twenty-four of these cases shows that in most of them the injections have been followed by very marked improvement in the disease and in some cases by almost complete subsidence.

1. Ma Pain, Chinaman, aged 33, had nodules in both ears, loss of sensation in both legs and thighs, ears, and cheeks, and had raised patches on the face, and anæsthetic patches on the back He has been given four injections of leprolin at intervals of about a fortnight, of 20 c.c. each in the gluteal muscles, and the sensation on the face, on the legs and thighs and on the ears has completely returned, the nodules in the ears have completely disappeared, he has had no pains in the limbs as formerly, and the raised patches on the cheeks have become almost unnoticeable. After each injection he had a sharp rise of temperature, which lasted from one to three days, during which period all the anæsthetic patches became red, swollen and hot, which was followed by gradual subsidence of the tubercles, raised patches and anæsthetic areas, and return of sensation all over the body.

2. Naranswamy, Hindu, aged 49, had anæsthetic furfuraceous patches on the shoulder and chest, with complete loss of sensation in these patches.

He was injected three times, at intervals of about a fortnight, and after each injection had a sharp rise of fever, followed by the same symptoms as in the first case, after which the furfuraceous patches gradually disappeared, and the sensation returned.

3. Maung Pan Se, Burman, aged 39, had anæsthesia all over the left foot and leg, with ulceration of the left foot, in which the bacilli where found in large numbers. After one injection the ulceration healed up, and the sensation returned, there remaining no sign of the disease. This man had been suffering from the ulcerations for five years.

4. Ram Sandy, Hindu, aged 48, had anæsthesia all over the body and ulcerations of the fingers and toes, in which the bacilli were detected. After one injection the ulcers are almost healed up, and the sensation has returned, and the former pains are absent.

5. Maung Po San, Burman, aged 34, had anæsthesia all over the legs, nodules in the arms and shooting pains in the limbs, and patches on the face. He was injected four times, at intervals of about a fortnight, the same reaction as in the other cases taking place after the injections. The sensation returned in the legs, the nodules in the arms have almost disappeared, the appearance of the face has greatly improved, he is stronger and has no pains.

6. Maung Po Nyun, Burman, aged 36, had anæsthetic patches on the legs and thighs with furfuraceous skin, and tubercular appearance of the face, he had pains and could not walk about. After four injections he has very much improved and can walk about, the sensation has returned in places, and the furfuraceous appearance of the skin is disappearing, while sensation in places has returned and the pains have ceased.

7. Maung Po Kan, Burman, aged 22, had anæsthetic papules all over the body. One month after injection he had a sharp rise of fever and all the papules broke down into ulcers, which healed up and are now disappearing; there was great tenderness all over the body, which has subsided, sensation returning in places, and the original papules have almost disappeared.

8. Kistama, Hindu, aged 41, had sores on the hands and nodules in the ears, shooting pains and anæsthetic patches. After four injections these symptoms have gradually become less evident, the sores healing, the sensation returning, the pains ceasing and the nodules disappearing.

9. Maung Tun Hla, Burman, aged 15, had anæsthetic patches on the face and arms, which after two injections, have become less evident.

10. Maung Po Thit, Burman, aged 22, had anæsthetic patches on the abdomen, which, after two injections, became much smaller and the sensation returned.

11. Maung Kya Bwin, Burman, had nodules on the forehead, ears and nose, and large shining patches on the body, which were anæsthetic. He was injected three times, after which the nodules became smaller, the sensation returned, and the pains ceased, and he became much improved.

12. Maung Pyan Boo, Burman, had nodules on the forehead, ears and nose, and brown anæsthetic patches on the body. These symptoms, after one injection, began to vanish, but he was released from jail, and lost sight of.

13. Maung Tun Gyaw, Burman, had tubercular patches on the face, forehead, ears and nose, anæsthesia of the dorsum of the feet and affection of the fingers. After three injections, the sensation in feet has returned, the nodules and shiny appearance of the skin are gradually disappearing.

14. Nga Hein, Burman, had large brown anæsthetic patches covering the face and a large anæsthetic patch on the right side of the back and anæsthetic patches on the arms; he had two injections, after which the patches on the body mostly disappeared, the sensation returned, and the patches on the face almost disappeared.

15. Po Nyun, Burman, had raised scaly anæsthetic patches all over the body, extremities and face, and nodules in the ears, lips and nose. He was injected twice, the scales peeled off, the sensation returned, and the nodules became smaller.

16. Po Hman, Burman, had nodules on the forehead, ears, cheeks and nose, and brown anæsthetic patches all over the body, fingers

bent and skin of legs furfuraceous. He had two injections, which were followed by return of sensation and clearing up of the furfuraceous patches on the legs and, to some extent, disappearance of the nodules.

17. Shwe Gno, Burman, had nodules and loss of sensation in the ears, and elevated thick patches on the legs, arm, abdomen and face, after three injections sensation returned in the ears, and the nodules became very much smaller, and the patches on the front of the abdomen vanished.

18. Tha Noo, Burman, had nodules and loss of sensation in the eyebrows, lips, ears and cheeks, and anæsthetic raised, tubercular patches on the legs and back, enlarged glands in the groins and ulcers on the arms and legs. He had three injections; the ulcers healed, the glands subsided, the anæsthesia vanished, the nodules became very much smaller and the patches disappeared, and he showed on the whole very remarkable improvement.

19. Po Kya, Burman, had tubercular patches on the face, ears, forehead, nose and lips, tubercular anæsthetic patches on the arms, and ulcers on the arms and legs. After one injection these symptoms gradually became less evident, the sensation returning, and the tubercles becoming smaller.

20. Nga Hein, Burman, had anæsthetic patches on the feet, hands, legs and trunk, thickened patches on the nose, ears, and body. After one injection the sensation returned in the soles of the feet, the tubercles became smaller and the pains ceased.

21. Tan Gyaung, Burman, had numerous anæsthetic patches all over the body and tuberculated ears, face and nipples, and swollen fingers and toes. After one injection the sensation slightly returned in some patches.

22. Pan Myoe had tubercles on the face, ears, lips and chin, thickening of the fingers and toes, and anæsthesia of the thighs and legs and ulceration of the right elbow. After one injection he showed no signs of improvement and refused a second injection.

23. Nga Bwin, Burman, had thick anæsthetic patches on the face, forehead and ears, and swollen furfuraceous feet. After one injection he showed no signs of improvement, and refused a second injection.

24. Swe Kyu, Burman, had anæsthetic tubercles on the forehead, lips, cheeks and nose, and furfuraceous patches on the legs, and thick fingers and toes. After one injection he showed no signs of improvement and refused a second injection. Of the other cases injected, five have only just been injected and shown the characteristic reaction, and three have escaped my notice.

Out of the 24 cases above recorded, in four there was no improvement, but in no case was the disease enhanced.

Cases 1 and 2 have apparently been almost cured, there remaining hardly any sign of the original disease; cases 9 and 21 were only very slightly improved, but were only injected once and twice respectively, while those four cases which showed no sign of improvement were also injected only once or twice.

In looking through the notes of the cases, I find that in those cases where the reaction after the injection was severe, there was a great improvement in their condition, and in those cases where there was only a slight or no reaction the improvement was slight or *nil.*

Four of the above cases were treated at the General Hospital; sixteen were under the kind supervision of Captain Fenton, I.M.S., at the Rangoon Central Jail, and the rest were treated at the Kemmendine Leper Asylum, through the kind permission of Father Frenney.

The cases treated at the jail did not have the salt treatment, while all the other cases had salt internally and application of salt ointment.

The application of the salt ointment appears to be efficacious to the sore or patches when they become inflamed after the injection of the Leprolin.

Case 3 healed up in a marvellous manner, the skin becoming perfectly smooth. The reaction symptoms are not due to the glycerine, as the pure Leprolin without the glycerine produces a powerful reaction.

Sufficient time has not yet elapsed to be able to state that this method of treatment of leprosy is a radical one, but it would appear certain that the Leprolin has a very marked beneficial action in the disease, which is not accompanied by any danger of aggravating the disease. The above cited cases will be injected again and again until all signs of the disease have vanished, and from what I have seen up to date, and from the marked improvement in some of the cases, I think that this may be confidently expected.*

NOTES ON THE DESTRUCTION OF MOSQUITOES IN BIJAPUR.

BY A. HOOTON,

CAPT., I.M.S.,

Civil Surgeon, Bijapur.

THE following notes may perhaps be of interest as showing the results of the treatment of mosquito-breeding grounds in a locality where these are comparatively favourably situated for obliteration or regular inspection. It is necessary to remark that no systematic examination of the

* Since the above went to press, we have heard from Capt. Rost that "All the Jail Cases have very much improved. Nga Bwin, No. 23, has improved, the sensation returning and the furfuraceous appearance of the skin disappearing. Another has also improved, the sensation returning and the patches assuming a natural appearance. Swe Kyu has slightly improved. Three more cases at the General Hospital have been injected lately and have now shown signs of marked improvement. The total number of cases is now forty."—ED., *I. M. G.*

blood of fever cases was made, so that in most cases the diagnosis was simply clinical, confirmed by the efficacy of quinine, and that no attempt was made to distinguish between different species of anopheles and culex respectively. The observations refer to two distinct areas: the town and citadel, and the prison.

Conformation of the ground, and other features of the locality.—The town of Bijapur consists of several straggling subdivisions, situated partly within, and partly outside the walls of the ancient city. It is surrounded on every side by old buildings, in a more or less advanced state of ruin, and elevations and depressions corresponding to collapsed houses and walls and the intervals between them. Here and there are to be found disused wells, the sides of which have fallen in, and vaults, partially obliterated in the same way. There are also tanks attached to many of the old mosques, and it is obvious that surroundings of this character are very favourable to the lodgment of casual water.

The outer walls of the city are surrounded by a moat, which still harbours water in certain situations. The citadel, approximately at the centre, is also partly enclosed by a wall and moat, in one reach of which water remains throughout the cold weather. Three of the official residences are within the citadel. Two large reservoirs, the Taj Baori and the tank of the Asar Mahal, are fed from tanks at some distance by ancient subterranean aqueducts.

The waste water of the houses in the town flows partly into open gutters, and so into an open drain, but for the most part is allowed to collect in cesspits, which are never emptied.

The citadel enclosure and its immediate vicinity are fairly well-wooded, but with these exceptions there are few trees in the neighbourhood. High winds prevail throughout the greater part of the year, and small collections of water soon evaporate. The district prison is about two and-a-half miles from the citadel, and the ground adjoining is broken up by ruins as previousely described.

Population.—The population of Bijapur, according to the last census, was 23,630.

Rainfall.—The average rainfall for ten years previous to 1896 was 27·37 inches. In 1902 the amount registered was 21·18, while the total for 1903 was 30·77 inches. The interval between these two periods includes several seasons of drought; the ground water had sunk very low before the monsoon of 1902 set in, and it is doubtful whether it has even now recovered its normal level. For this reason collections of standing water may be assumed to be still unusually scanty.

Prevalence of mosquitoes.—From September 1902 to April 1903 there were many mosquitoes in all the houses with which I am acquainted; these were for the most part culex, though anopheles were to be found on careful search. The official residences in the citadel, the warders' quarters at the prison, the houses of the prison staff and the cells were equally infested. Residents in the town itself also complained frequently of the annoyance caused by mosquitoes.

Distribution of mosquito larvæ.—(1) *Citadel and town.*—At the commencement of the hot weather, when, with the exception of a few large reservoirs and the moat, no water was to be found, and in a situation far removed from irrigated land, it was at first difficult to account for the mosquitoes, which still infested the houses in considerable numbers. In the case of the Asar Mahal tank, which is close to the citadel, repeated examination failed to discover any larvæ, and search has been made in several elevated stone cisterns with a like result; both culex and anopheles were found in small numbers in one section of the inner moat, but it did not appear probable that these were the main source of the mosquitoes in the three houses of the citadel and the attached servants' quarters. There was, however, a tank of considerable size in connection with a neighbouring mosque (the Maka Masjid); in this a small quantity of water still remained, and swarms of larvæ, both anopheles and culex, were found. During the rains anopheles larvæ were also discovered in some low-lying ground in the Collector's compound, and in various shallow pools along the roadside. Culex, no doubt, had bred to a certain extent in broken earthenware vessels and discarded tins, which were removed at the commencement of operations, and in the town large numbers breed in the cesspits, which receive waste water from bathing places and cook-rooms; in many cases each house has one of these, but occasionally the bath-rooms of several houses drain into one large pit. The contents of pits in which larvæ were breeding were sometimes distinctly foul.

(2) *Prison.*—In the case of the prison also, the source of the numerous mosquitoes was not at first obvious, but larvæ were eventually found in many situations. Anopheles bred in the hot weather in a ledge situated inside the mouth of a well, into which a small spring trickled, and in two of the garden cisterns; after the early rains they were also found in a disused cistern in the prison yard. Culex bred in the same, and the following additional situations: two traps at the manholes of the surface water drain, the zinc gutters which convey rain water from the roof of the cells, hollows in masonry and a shallow disused well 200 yards from the prison walls. A receptacle for surface water supplied the whole of the warders' lines with mosquitoes, and an increase observed in the jailor's quarters was traced to a water cart, which had been standing for some time opposite his windows. Culex larvæ were also found in depressions on the roof of a small mosque near the prison.

Measures taken for the destruction of larvæ.—Steps were taken on the lines laid down by

Major Ross, I.M.S., for the abolition of breeding places and destruction of larvæ. Pools were drained or filled in, discarded vessels and tins removed, the Maka Masjid tank was filled in, and, at the prison, a regular weekly inspection is now made, for the purpose of applying kerosine oil where necessary, and sweeping away small collections of water. In the town two men, paid out of a small municipal grant, were tentatively employed in the same way, but this arrangement has been interrupted owing to the recent severe epidemic of plague and consequent evacuation of the houses; they were, of course, only capable of dealing with anopheles resorts, as these became known. A vernacular leaflet was also circulated, explaining the object of the measures employed, and some of the educated inhabitants began to take an interest in the work.

Results.—The records of the civil hospital are useless in this connection, owing to the outbreak of plague and the diminished attendance which resulted.

The prison records are not affected by these conditions, and the admissions for malarial fevers for the last two years are quoted below. It may be noted that the rainfall in 1903 was heavier than that of the previous year, and there is no apparent reason why malarial fevers should not, other things being equal, have been as prevalent in the former.

During the year 1902 the average daily strength was 408·3; 88 prisoners were admitted to hospital for ague and remittent fever, showing a proportion of 21·5 per cent.

During the year 1903 the average daily strength was 301·1; 41 prisoners were admitted for these diseases, showing a proportion of 13·6 per cent.

These figures do not represent the total comparative prevalence of malarial fevers during the two years; in the autumn of 1902 many men were treated in the convalescent gang for more or less pronounced symptoms of malaria, while during the past year no such measures were called for. The health of the prison, in this respect, was undoubtedly better in 1903 than in 1902.

No statistics are available with regard to the number of cases of malarial fevers in the three houses in the citadel, and they would in any case be misleading, owing to the fact that several quarters have been vacant for long periods; but there have certainly been fewer actual cases, and it would probably be safe to say that here also there has been a marked relative diminution.

As regards mosquitoes, the closing of the Maka Masjid tank has caused an almost total disappearance in one of the citadel houses, and a great diminution in all, and the measures taken at the prison have resulted in a very marked reduction of mosquitoes in the quarters of the staff, the warders' lines and the cells.

Further operations.—It is proposed to prevent the accumulation of water in the citadel moat by a combination of filling in and drainage, and to continue work on the lines previously indicated. Under the conditions prevailing here the question early arises whether an attempt should be made to deal with both culex and anopheles mosquitoes, or only the latter. On the one hand it may be said that anopheles no doubt occasionally breed in situations where only culex larvæ may have been found, that culex give rise to filariasis, and that they are also a constant nuisance; but it has also to be remembered that the regular resorts of anopheles are usually very much less numerous, and that if these are treated, the vast majority of the genus will be included; while in Bijapur, as in many other places, noticeable disease due to filariasis is so rare that it can be disregarded in this connection. The argument, to my mind, most in favour of a sweeping crusade against all mosquitoes, is the marked improvement in general sanitation which necessarily accompanies, and one would certainly prefer to work on these lines. This is the course which appears to have been almost exclusively advocated by well-known authorities, but I notice that Sir P. Manson, in the last edition of his 'Tropical Diseases,' takes up a different standpoint: 'War need not be waged against all mosquitoes; our present knowledge seems to indicate that only anopheles has to be considered.' Economy is usually an object in these matters, and in some cases, where the extra expenditure necessary to institute comprehensive measures against all varieties may mean the abandonment of the whole scheme, it is well to remember the alternative. Considerable sums have recently been expended here on plague operations, and it is not likely that much money will be at present available for anti-malarial measures, but there seems every probability that a great diminution of anopheles mosquitoes may be effected at a comparatively small cost.

LEMNA MINOR AS A PREVENTIVE AGAINST MOSQUITOES.

By J. R. ADIE,
MAJOR, I.M.S.,
Civil Surgeon, Ferozepore.

DURING last autumn I searched a tank in the Deputy Commissioner's Office compound. It was a sort of hollow, out of which mud was obtained to build outhouses, &c., originally, and one which is usually described as a dirty green slimy pestilential tank—"a disgrace to a compound," etc. Such tanks are common all over India. It was about 20 yards square, and a buffalo was enjoying himself in the middle.

I could not obtain a single larva of any mosquito in this tank. The green scum was thick and covered the entire surface of the water. In one or two spots on the windward side the water was free from green; but here even there were no larvæ. At that time of year, larvæ were quite plentiful in other naked waters.

I then searched another and much larger tank of the same nature. It is about 80 yards square and near it is a large cantonment latrine. The entire surface of the tank, barring a narrow streak near the windward bank, was covered thickly with green scum. Not a single mosquito larva could be found anywhere. This led me to look into the surface more closely, and I found that the green scum consisted of myriads of plants, each of which had two thick round flat floating leaves with a slender root going down into the water. The leaves were so thickly and closely packed that the surface of the water was completely hidden. It was physically impossible for a mosquito to reach the water to lay her eggs. Major Prain, I.M.S., kindly identified the organism as *lemna minor*. Naturally, the question arose, why were there no larvæ in the narrow open streaks of uncovered water by the banks? The answer probably is, that as these naked spots are the result of winds, and as winds vary in direction, a naked spot to-day might be thickly covered to-morrow, and naturally such uncertain waters would not be safe shelters for larvæ; and mosquitos seem to have learnt this from experience.

To test this, I cleared certain small areas near the banks of all *lemna*, and enclosed them with light floating structures, which were fixed enough to resist the winds—in fact, made experimental pools. I was pleased to find in due time plenty of anopheles larva in these pools.

This seemed to prove that *lemna* acts as a mechanical obstruction to the process of egg-laying, and a very obvious method of prevention occurred to one. Why not deliberately promote the growth of *lemna minor* in all unavoidable collections of water to prevent the propagation of mosquitoes? Thus it might turn out that the pestilential green scum, which we have been in the habit of anathematising, is really a boon and a blessing.

At any rate, I recommend its trial, for it appears to be easy and cheap to manage.

In our Cantonments there are about half a dozen unavoidable tanks, that is to say, tanks which are too expensive to fill up. There they have to stay giving rise to innumerable anopheles, and incapable of thorough treatment. I would recommend planting *lemna minor* in such.

In the winter, there is another kind of green scum in water-collections, which does not interfere with egg-laying. It is found in ditches, hollows and borrow pits after accidental rain. Examining it under the microscope, it consists of millions of small green flagellated organisms which are ever on the move. It would not be expected to have any preventive use, as the water is not sufficiently hidden. Continuing my observations on those two tanks, I find *lemna* disappears or gets scanty in the winter. Even if this is the usual case, it seems to flourish in the latter half of the year, and this is the most important time for prevention. I would invite other doctors to investigate the matter and report.

NOTES ON THE CULTIVATION OF STREPTOTHRIX MADURÆ.

BY J. W. CORNWALL, M.A., M.D. (CANTAB),

CAPTAIN, I.M.S.,

Professor of Hygiene and Practical Bacteriology, Madras Medical College.

THE credit of being the first to direct attention to the probably fungoid nature of Mycetoma must be given to Vandyke Carter of Bombay, but it is exceedingly improbable that this officer succeeded in growing the fungus, since the pink Chionyphe Carteri, which he was inclined to regard as the causative factor of the disease, was grown from a specimen bottled in spirit which had been kept for two years in the dissecting room! Vincent in 1892 and Boyce and Surveyor in 1894 appear to have been the only investigators who have recorded their success in growing the fungus up to date from a case of the disease.

The cultures that have been worked with in European laboratories during the last few years have had their origin from one of these.

During the last three years I have made several attempts to obtain a growth from the granules picked out from feet amputated by Capt. Niblock, I.M.S., in the General Hospital, Madras, on account of this disease, but I met with no success until lately.

The causes of failure were contamination of most of the tubes inoculated with pus organisms and the apparent sterility of those granules which happened to be uncontaminated.

I succeeded at length in obtaining the granules free from pus organisms by taking them with every precaution from the deepest of the sinuses of a recently amputated foot and by washing them thoroughly in at least six changes of sterile salt solution before planting them out.

Out of 17 tubes thus inoculated none were contaminated.

Growth occurred in every case on the agar tubes, but potato, hay infusion and glucose agar tubes showed no growth.

Some tubes showed a visible growth after about a month in the incubator, some not till after two months.

In some cases the growth assumed a pink colour, in others it remained a dull white. In subculture the streptothrix appeared to have become accustomed to the agar substratum and grew much more freely, preserving however its characteristics, one of which is to adhere so closely to the medium that each nodule has literally to be dug out with a very stout platinum wire when it is required to transfer it to another tube.

In subculture fluffy, ball-like growths were obtained in broth and hay infusion tubes.

So far the cultures show much the same appearance under the microscope as the tangle of streptothrix filaments found in preparations made by squashing one of the original granules between cover glass and slide and separating the two. By far the best stain is Gram's.

Good preparations can also be obtained with Delafield's hæmatoxylin, methyl violet and carbol thionin, but the staining is not so intense as with Gram, nor is the definition so good.

The streptothrix is a very delicate one and branches freely, exhibiting at intervals tiny nodules in the course of or at the side of the threads.

I have never had the opportunity of endeavouring to make a culture from the black or rose varieties, nor have I ever seen the latter.

The streptothrix requires plenty of oxygen for its growth and only occasionally forms the pink pigment in artificial culture, so it appears quite probable that the causes which lead to the formation of pink pigment in artificial culture are similar to those which lead to its formation in the foot of a man, and that there is no essential difference between the two varieties.

As to the black variety, cultures ought to be able to settle its nature also. No worker seems to have been successful in animal inoculation with this streptothrix, but finding no specific mention of bovines I have, with the aid of Lt.-Col. Bannerman, I.M.S., made a fresh attempt, the success or failure of which time has not yet declared.

I am induced to publish this note as a transfer renders it improbable that I shall be able to continue experiments.

REPORT ON PLAGUE AND INOCULATION OPERATIONS, AMRITSAR DISTRICT, 1ST OCTOBER 1902 TO 20TH JUNE 1903.

BY S. BROWNING SMITH,

CAPTAIN, I.M.S.,

District Plague Medical Officer.

A.—PLAGUE.

1. *State of infection on 1st October* 1902.—Sixty villages were infected in the spring of 1902, but by the 1st of October they had all been declared free except Amritsar City itself, which had remained infected since the occurrence of this first case on 16th February 1902.

2. *First village.*—The first village to report a case was that of Bhilowal Mad, where one occurred on 1st October. As soon as it was recognized, the case was removed into the fields about a mile from the village, and, owing to this prompt action, no other case occurred there. I may add that the action taken was spontaneous on the part of the villagers themselves and not due to official advice, and this was encouraging, in so much as it seemed to show that, although plague had never visited the village before or indeed any other village near it, still the people themselves were, to a certain extent alive to the exigencies of the situation.

3. *Gradual spread.*—The 2nd village was Vairka, population 3,709, about 7 miles from Amritsar where the disease soon obtained a strong hold, and caused 175 cases with 113 deaths before the epidemic came to an end.

The third place to become infected was Majitha, a large centre and Municipal Town, population 6,490, about 12 miles to the north of Amritsar.

Kasel and Gandiwind, two large contiguous villages in the west of the Tarn Taran Tehsil, became infected, the former from Vairka and the latter from Amritsar City. These places, and later, Tarn Taran, population 4,428, 15 miles south of Amritsar, and Jandiala, population 7,877, both Municipal Towns, which became infected on 27th November and 8th January, formed the principal foci from which the infection spread. On January 7th, 100 villages had been declared infected; other outlying points of infection were, Bath in the Ajnala Tehsil, infected from Kamalpur in the far north, which had become infected through Bue Nangli near Amritsar.

In Tarpai, a village on the edge of the district near Gurdaspur, the seventh village infected, no history of infection could be traced, but the epidemic was preceded by an unusual mortality among rats.

Uddoke on the same border was infected from Rasulpur near Amritsar.

Jalal Usme, far away to the east of the Amritsar Tehsil, was infected from Dheriwala in the Gurdaspur district.

4. *Rapid increase.*—The number of infected villages rapidly increased in November.

For convenience of reference the number of villages newly infected in each month is given below :—

October ...	... 3	February...	... 87
November ...	... 32	March ...	... 118
December ...	... 48	April ...	... 127
January ...	... 69	May ... to June 20th 17.	... 98

April was the worst month in this respect, and the first part of May up to which time there was a steady increase, the decrease beginning from about the middle of May.

5. *Total number of villages infected.*—Out of a total number of 1,047 villages in the district, 566 were infected with plague during the period covered by this report, considerably more than half.

Of this number, thirty-eight suffered a second epidemic from reinfection.

6. *Plague cases and death.*—The number rapidly increased up to the end of November, but during December and Junuary, the totals every week remained fairly stationary, varying from 550 to 850 weekly in spite of the daily increasing number of infected villages, showing that, during these months, although there was a multiplication of infected centres, yet in infected places locally considered there was a lull or decrease in the severity of the epidemic.

In February an upward bound took place and, as the weather became warmer, this rise became more rapid, a very marked increase being shown at the beginning of April, in which month and the first fortnight of May the full force of the epidemic culminated.

7. *Decline.*—From the middle of May, the severity of the disease began to rapidly diminish and in the week ending June 6th the weekly total of cases had fallen to 882, the first time it had been below four figures since the middle of February. At the date of

submitting this report the number of villages in which the disease was present was only 35.

8. *Freedom of river borders.*—The Amritsar District is, roughly speaking, an irregular square with angles north, south, east and west; the River Ravi runs along its north-western border and the River Beas along the south-eastern; it is interesting to notice how free from plague those parts of the district that adjoined the rivers kept until well on into the spring.

Dividing the district into quarters by three lines running from the north-eastern to the south-western border, the two central quarters were very badly infected, while the outer quarters remained comparatively free until late in the epidemic.

9. *Pamphlet.*—As it was found, on visiting villages, that the inhabitants often asked what they could do for themselves in the way of disinfection, and there was, although they were not prepared to accept disinfection at the hands of Government servants, a general desire to help themselves, a short pamphlet was written concerning plague and inoculation, simple methods of disinfection that people could carry out for themselves, the necessity of avoiding contact with infected people and their belongings and the danger of entering their houses; they were also told that they could appoint a chowkidar to prevent people from infected villages entering their own; a certain number of villages availed themselves of this privilege.

The two main points to be observed in a pamphlet or rather leaflet were brevity and simple language.

This pamphlet was translated into Urdu and Gurmukhi, and 800 copies of each were distributed, through Tahsildars to every village.

This, I think, supplied a want, and reports seemed to show that, in many places, villagers were keen about cleaning their houses with fires and their clothes with boiling water. It also, I think, showed the people that we really desired to help them, without in any way compelling them, and so perhaps made them look on Government assistance with a more favourable eye.

10. *Mode of infection.*—In the great majority of villages infection could be traced to human intercourse between healthy and infected villages, and this is doubtless the manner in which the disease spreads from village to village, the usual history being that a person went to an infected village to visit relatives attacked with the disease or to be present at the funeral ceremonies of dead relatives; on return to the healthy village, the person developed plague; the next step was the infection and death of rats in the infected and adjoining houses, *followed* by a rapid spread of the epidemic, plague occurring in those houses and parts of the village in which rats died.

In 391 villages, in which inquiries were made, 284 reported that unusual mortality among rats *preceded* the outbreak of plague, in only 71 it followed the outbreak, and in a still less number, 36 was there no rat mortality. These observations cannot, however, pretend to any scientific accuracy, and in the majority of these 284 villages the infection was certainly imported by man, and one or two cases may have occurred before rats were infected; these cases, however, were probably kept as quiet as possible and consequently, to the general eye of the village, the death of rats preceded the epidemic. In my opinion it seems to show that, after the first introduction of infection by man, the main factor in the rapid and wide distribution of the disease throughout the village was the rat.

The disease spread among rats from house to house, plague among the inhabitants of these houses following in from 3 to 14 days, the most usual interval being about 6 or 7 days.

11. *Infection apparently arising spontaneously.*—Although infection can be traced in the majority of villages to the agency of man, in quite a considerable number no history of such importation can be elicited, which induces me to raise the following question: "Can the pathogenic power of the bacillus be of so mild a character that it may remain latent, producing no perceptible disease or disease of such a mild type that it is not recognized as plague, until, by infecting and passing through the rat, its virulence is so intensified that infection from the rat produces a fatal epidemic?"

12. *Pneumonic and bubonic infection.*—Before leaving the subject of infection I may mention the case of the following village, which seems to suggest that pneumonic plague spreads principally by human intercourse, bubonic by rats.

Munda.—Dina, a jullah, returned from the infected village of Bagrian on 26th January 1903, attacked on 27th January 1903, died same day, and fifteen members of this family died of pneumonic plague; the epidemic was pneumonic and only lasted a short time and did not spread far, the last case occurring on 8th February 1903.

No rats were seen dead during this epidemic.

On 7th March 1903, Mela, a jullah, returned from Nagoke, took ill on 13th March 1903 and died same day of bubonic plague; rats began to die on 10th March 1903 in the houses adjoining, and the first case, after Mela, occurred in them on 14th March 1903. The epidemic lasted till 29th May and caused 174 cases with 144 deaths; the epidemic was of the bubonic type.

This also shows the importance of the rat in spreading the disease as the first epidemic was quite local in character and did not spread.

13. *Reinfection.*—Sixty villages were infected in spring 1902. Of these, 40 were reinfected during the present epidemic. It was found that villages badly infected in spring, suffered comparatively slightly on reinfection, many escaped infection until quite late in the season, and some, 20 escaped altogether, although mostly surrounded by badly infected areas.

In the great majority of cases, reinfection was traced to human intercourse, and in only a few did it apparently spontaneously reappear, in which cases the epidemic was preceded by unusual rat mortality. In no case did it appear that any of these villages infected in the spring and declared free had been a focus of infection during the present epidemic.

The three factors determining the partial or complete escape of villages previously infected are probably:—

1. Protection afforded by previous attacks.
2. Insusceptibility of others.
3. Extermination of rats by plague.

14. *Reports.*—Whether the result of previous years' operations and methods of compulsory evacuation, disinfection, &c., or not, the general idea pervading the whole district which even now, is only gradually disappearing, was that the occurrence of a case of plague in a house was but the precursor of other evils to the inhabitants thereof and to the village itself, in the shape of Government interference which would

only be averted if the case could be successfully concealed; as long as the patient lived this could often be done, and it was only on death supervening that the case came to light and was reported. The proportion of deaths to cases is certainly therefore too high; in many instances villages have returned the same number of deaths as cases, making the case mortality 100 per cent. The case mortality in fact in the earlier part of the epidemic depended as much on the ability and energy of the village reporting agent as it did on the severity of type of disease.

As the epidemic progressed and the people found that they were not being interfered with, and patwaris, &c., became more impressed with the importance of their duties, this condition of things gradually improved, and, towards the end of the epidemic, reports became much more accurate.

15. *Plague in uninoculated and case mortality.*—The total population of the District is 1,023,828. The number of cases and deaths from plague during the period under report was :—

Cases	...	...	41,462
Deaths	...	...	27,879

Giving the following rate per thousand of population :—

Cases	...	...	40·5 per thousand.
Deaths	...	...	27·2 „ „

For the reasons given in the preceding para, the death-rate is the more accurate index of the severity of the epidemic.

The number of cases and deaths among inoculated was 770, and 238 respectively, which being subtracted from the above gives the following totals of cases and deaths among the uninoculated :—

Cases	...	...	40,692
Deaths	...	...	27,611
Giving a case mortality of		...	67·85 per cent.

The incidence of plague in inoculated and uninoculated and the comparison between them and also the case mortality of plague in inoculated persons will be fully discussed in section B.

16. *Type of Disease.*—In the large majority of cases Bubonic. There were some epidemics, particularly in the Tarn Taran Tehsil, of pneumonic type, and a small number of septic.

17. *Other animals than rats affected.*—In the majority of villages, squirrels died in considerable numbers, dropping dead from trees in compounds of or near infected houses; also when people evacuated their houses and lived under trees near a well, there were frequently many deaths among the squirrels living in these trees. There were instances in some villages of unusual mortality among dogs, for instance, about a fortnight after plague broke out at Waneke out of 10 dogs, attached to one house, 9 died in 2 or 3 days; in a temple outside the village 7 dogs all died.

Deaths among cats is also reported. In one village, Laukha, after the epidemic was at an end, large numbers of sparrows died, dropping dead from the roofs of the houses.

It was a matter of general remark in most villages that, when an epidemic became at all severe, crows, which usually abound, completely deserted the village, returning after the epidemic had abated; dead crows however were not noticed.

No unusual mortality among cattle was reported.

B.—INOCULATION.

Attitude of the people.—At the commencement of operations, the attitude of the people towards, not only inoculation, but to any Government interference whatever, was one of vague fear and distrust, in many places of distinct hostility; although, before the spring of 1902, there had been no plague in the district, the minds of the people were saturated with rumours, vague and absurd, but, on account of their very vagueness, looming the larger in their imaginations; rumours of being turned out of their houses and villages, with destruction and loss of property, rumours of inoculation needles a yard long, which were pushed in at one side of the body and emerged at the other, rumours of a hundred and one ailments and even death following inoculation. Reports began to come in early in October that not only was the general mass of the people against inoculation but that certain zaildars and other local influential officials were preaching against it; steps were at once taken to meet this, and the majority of zaildars were called in to a meeting at the house of the Deputy Commissioner on October 15th, and Risaldar Partab Singh, E.A.C., was telegraphed for by the Commissioner to come in from Gurdaspur and address them which he did, all the apparatus was shown to the meeting and explained, the Deputy Commissioner, myself and the inoculating officers present were inoculated before the meeting and eventually the large majority including those who were reported to have been most hostile were inoculated.

While writing of rumours I will refer here to one which arose much later and rapidly spread all over the district, and was only effaced by the distribution of an official printed denial by the Deputy Commissioner, which was that a fee was to be charged for every person inoculated; inoculating officers had at times to write a certificate that no fee would be charged before any one would come forward. Said they "if a fee is not going to be collected afterwards why 'are you so careful to write every one's name, parentage and address down in that book' referring to the Inoculation Register, and it must be admitted that it was not an easy question to answer, for we could hardly explain that we were writing down their names principally for the sake of verifying cases of plague among the inoculated! The circulation of a printed official denial effectually killed this rumour.

First steps.—On September 30th, a meeting of Native Practitioners, Hakims and Baids from the city was held at the Civil Surgeon's house. Lt.-Col. Mulroney, I.M.S., gave them a very excellent address fully explaining the nature, preparation and action of the inoculating fluid, and some inoculations were performed before the meeting.

On October 1st a meeting of Editors was called at the Deputy Commissioner's house and inoculation explained to them.

On October 2nd a similar meeting was held of all the influential men of the city official and non-official. Many excellent speeches were made in favour of inoculation.

General plan.—It was soon found that it was practically impossible to inoculate in villages not infected with plague; even if the village, as a whole, was not opposed to inoculation they would say that as there was no plague then they saw no use in undergoing the slight pain and inconvenience caused by it, but that, should plague appear, they would reconsider the question.

Attention was accordingly directed especially to those villages which were infected, and where, in consequence, the villagers, much frightened at the mortality occurring, listened more attentively to the proposals for their relief.

What generally happened was this: the personal assistant to the Inoculating Officer having ascertained that one or two lumbardars or other officials would come forward with their families, the village was visited, and perhaps 50 or 100 inoculations performed, and this was reckoned a good result for a first visit; some days afterwards, when the people were satisfied that no harm had resulted from the operation, and the previously inoculated had persuaded their friends to come forward, a second visit would result in perhaps another 100. When this had been done, it usually happened that one or two cases of plague occurred among the inoculated; if these recovered, the third visit usually resulted in a good haul, but if a death occurred, the desire for inoculation was at once quenched until the people actually saw for themselves that, although one or more casualties had occurred, still the large majority had escaped, and they saw the thing was good; a petition would then arrive from the village, and a third visit would result in 200 or 300, often more; by this time the epidemic was probably nearly over, and once it stopped, the desire for inoculation stopped also, although probably not more than a quarter, or perhaps a third, of the village had been inoculated.

Towards the spring, the fears of the people with regard to the operation were allayed in many parts, and villages would petition for inoculation at the beginning of an outbreak, sometimes on the appearance of an unusual mortality among rats, and occasionally a healthy village would come forward.

The Malkowal incident.—Doubtless this unfortunate accident had, in the larger towns and centres, a greatly deterring influence and destroyed, at any rate for a time, any faith in inoculation that had been partially aroused, and this influence spread to villages near and in close communication with these towns.

But this was not so in the majority of villages, and I will give an instance. I had done a certain number of inoculations before the accident occurred in a village, Vairka, the first in the district to be badly attacked; they had become convinced of the value of the operation and had asked me to go out again; the cessation of operations prevented me doing so for some time. I, however, borrowed from Dr. Browne, C.M.S., a few doses of the original prophylactic of March brew, and when the account of the accident had appeared in the papers and could no longer be considered confidential, I went out to the village and found a large number ready for inoculation. Before I inoculated I gave them an account of the accident, but all they said was that they had heard of it, but that they had seen for themselves the good effect of inoculation, and that the sooner I stopped talking and began operating the better they would be pleased; I had soon finished the few doses I had with me, and the genuineness of their feelings was evidenced by the reproaches of those who had to go away unsatisfied, the reproaches of some of the women taking the form of abuse which was evidently heartfelt. No, in my opinion, the Malkowal accident, bad as it was and severe blow as it was to all those who had the success of the operations at heart, did not make the situation an irretrievable one; lost ground, caused by the unavoidable delay of waiting for new prophylactic to be made, could of course never be made up, but once the issue of this, which, judging from previous experience in Jullundur and elsewhere, could be absolutely depended on, began, it was hoped that a strenuous effort would be made to redeem the scheme from failure.

It soon became apparent, however, that Malkowal had effectually quenched the enthusiasm with which the operations were started, and native officialdom soon perceived that whether they assisted or stood aloof, mattered little, and instead therefore of a small army of zaildars, lumbardars, &c., working for us and opening the gates of villages to the inoculating officer, we had to depend on the efforts of the personal assistant to the Inoculating Officer, to worm his way into a village; with the latter, the 2,000 inoculations done in the district up to the middle of December were increased to 60,000 before operations ceased; with the former, I believe, our figures would have been four or five times as large. The unfortunate delay caused by the accident, and the cessation of inoculation, from November 7th to December 12th, was utilized by inoculating officers, in visiting villages, treating sick, preaching disinfection and making themselves generally known in that part of the district in which they were to recommence inoculation as soon as the fluid was received.

A supply of medicines with each officer would have been of great value, but this could not be obtained; the Civil Surgeon, however, kindly allowed them to have their prescriptions made up at the local dispensaries.

That the accident, pending enquiry, had to be kept confidential while it was undoubtedly known, talked about and exaggerated by the natives probably helped to destroy confidence and certainly placed officers in contact with the people in an awkward position.

Other influences.—It was seldom that one could inoculate more than a half a village even after two or three visits; although those inoculated had become firmly convinced of the value of inoculation, they could not convince the remainder, and when asked the reason they said that the others had temporarily left the village because they were afraid of the "Punjabi Doctor," a term they seemed to apply to any native armed with a little brief authority and some disinfecting apparatus. Village factions were another difficulty in the way, one lumbardar working for and the opposite faction against: a lumbardar would report that a hundred or so in a village were ready, and a day would be fixed; the evening before, the opposite faction would concoct and circulate an enormous lie, the more ridiculous the better, which would completely put the applicants off and destroy any chance of inoculation in the village.

Other difficulties due to incomplete staff, delay in receipt of equipment and removal of staff and equipment to Delhi will be noticed under Section D.

The fact of having to confine one's operations to villages where plague was rampant, resulted in a large number of cases of plague in inoculated, which doubtless had a certain deterrent effect.

Education did not spread from a favourable village to others near it to the extent that I hoped, and as a rule every village had to be separately educated.

With few exceptions, which will be noticed under Section E, the attitude of the higher and educated classes, to whom we had a right to look for example and help to their poorer brethren, was one, if not of hostility, of complete apathy.

Number of Inoculations.—The total number performed was 62,773; rather more than 6 per cent of the total population. Of these 43,619 were males, 19,154 were females.

Only 4,243 were performed with the "new" fluid, before November 7th; of these 2,335 were done in the city, and only 1,908 in the district, the reason for this poor result being that operations could not be started in the district till October 23rd owing to non-arrival of necessary equipment. The numbers performed by individual inoculating officers are given below. I need hardly say that these figures do not in any way indicate an order of merit, as the totals depend on many circumstances, the ability of their assistants, the part of the district in which they worked, the time for which they were employed, &c.

NAME.	From	Males.	Females.	TOTAL.
Lt.-Col. Mulroney, I.M.S.	1st Oct.	1,223	124	1,347
Capt. S. B. Smith, I.M.S.	,,	6,934	3,258	10,192
Dr. A. C. DeRenzi	,,	4,002	761	4,763
Dr. Mayer	,,	12,398	6,011	18,409
Dr. Heron	1 Oct. 15 Dec. 19 Jan.—End.	9,202	3,914	13,116
Dr. Cavanagh	Dec. 23	4,955	2,050	7,005
Dr. Ellis	Feb. 27	2,682	1,171	3,853
Major Haynes, R.A. M.C.	...	533	55	588
Miss Vines, L.R.C.P. & S.	St. Mary's Hospital, Tarn Taran	1,124	1,264	2,388
Miss Gregg, L.R.C.P. & S.				
Miss Stuart, M.B.				
Dr. A. H. Browne, C.M.S.	Oct 1.	566	546	1,112

The highest number performed by a single officer in one day was 1,380 by Dr. Mayer, the nearest approach to this being 711 by the same officer, 605 by Dr. DeRenzi, and 611 by myself.

Inoculation by classes.—The numbers of inoculated persons divided into classes is given below.

High caste Hindus, Jats and other Hindus came forward readily both male and female, and one had not to observe the purdah system with them, the higher caste females being simply collected in a separate house or court-yard, the lower coming forward in the open with the men.

Muhammedans were much less ready to accept inoculation, and personally I only inoculated a considerable number on two occasions, and only on one of these, a large number of females, the only occasion on this I had to observe the purdah system.

INOCULATION BY CLASSES

Europeans	20
Eurasians	1
High caste Hindus	6,317
Other Hindus	34,972
Ramdasias, Chamars & Sweepers	5,071
Musalmans	15,779
Native Christians	481
Others	132
TOTAL	62,773

Reinoculations.—The number of these was only 882, leaving a total number of primary inoculations of 61,891.

Plague in Inoculated.—The total number of plague cases and deaths which occurred in inoculated persons was :—

Cases	770
Deaths	238

This comparatively large number is due to the fact that inoculation was principally done in villages in which plague was active; many cases occurred within a few days of inoculation and must have been incubating plague at the time of the operation.

A certain number of cases were inoculated who were afterwards discovered to have been suffering from plague at the time of inoculation. These 33 cases and 27 deaths should therefore be considered as plague in uninoculated, and they are accordingly deducted, which leaves

Cases	737
Deaths	211

to be considered in the subsequent calculations.

Out of 770 cases reported, 762 cases were verified, and a full list of these with all details is given in Statement No. VI of the appendix for reference.

[Not printed.]

The comparative few, only 8, that were not verified have not been excluded from the returns, as I think that the non-verification was more probably due to loss of certificates and indifferent clerking than to false reports.

In a few cases it was found that plague cases were brought for treatment to the inoculating officer on the plea that they were inoculated, and with a borrowed certificate, and were accordingly reported as cases of plague in inoculated, still, on referring to patwaris for details of result, these cases were discovered to be false and the returns corrected accordingly.

Case mortality in Inoculated.—The case mortality of plague in total numbers of uninoculated and inoculated, is given below for comparison.

	Case mortality per cent. cases.	Ratio of attacks to deaths.
Uninoculated	67·85	1·5 to 1
Inoculated	28·63	3·5 to 1

The case mortality in the uninoculated is certainly too high owing to bad reporting, and this is true also of inoculated, but to a much smaller extent, as inoculating officers have made it a part of their work to inquire into and report cases of plague in inoculated.

Statement No. 2 of the appendix shows the analysis of these cases, separating those inoculated with the new "small dosage" fluid from the others.

"New" prophylactic.—The few inoculations done with the new fluid and consequent small number of cases do not afford data for reliable figures.

The following are the figures :—

Occurred between 8th day and 120th day (first 4 months)	Cases	9
	Deaths	3
Case mortality	33 per cent.	
Ratio of attacks to deaths	3 to 1	
Occurred after 120th day	Cases	5
	Deaths	5

"Old" prophylactic.—The figures concerning the old prophylactic will now be considered: first, the total cases and then the cases according to their type, bubonic, pneumonic and septic, and work out the case mortality for every day of the first week, for the first four weeks and the first four months after inoculation.

The total number of cases, of which full details had been received up to 20th June 1903, was 718, with 227 deaths; of these 33 cases and 27 deaths are those in

which symptoms were present before or were exhibited at about the time of inoculation, leaving 685 cases and 200 deaths to calculate case mortality.

Plague, all types.	Cases.	Deaths.	Case mortality per cent.	Ratio of cases to deaths.
Plague at time or before inoculation ..	33	27	81·8	1·22—1
1st day after ..	25	15	60·0	1·67—1
2nd do. ...	18	18	44·4	2·25—1
3rd do ...	22	14	63·6	1·57—1
4th do. ...	25	10	40·0	2·5—1
5th do ...	10	4	40·0	2·5—1
6th do	21	11	52·4	1·91—1
7th do. ...	12	2	16·6	6—1
FIRST FOUR WEEKS.				
First week, excluding first three days ...	68	27	39·7	2·52 -1
First week, 7 days ...	133	64	48·1	2·08—1
2nd do. ..	126	36	28·6	3·5—1
3rd do ...	76	16	21·1	4·75—1
4th do. ...	68	14	20·6	4·86—1
FIRST FOUR MONTHS AND AFTER.				
First month, excluding first three days ...	338	93	27·5	3·64—1
First month, full ...	403	130	32·3	3·1—1
29—60 days	182	53	29·1	3·43—1
61—90 do ...	71	14	19·7	5·07—1
91—120 do. ...	26	3	11·5	8·67—1
After ...	3	...	...	...
TOTAL ...	685	200	29·2	3·43—1

In those cases which were inoculated, and afterwards were reported to have had symptoms of the onset of plague at the time of inoculation, the case mortality, 81·8 per cent., was higher than in uninoculated.

The first three days after inoculation, mortality was much the same as in uninoculated, slightly less.

On the fourth day a distinct improvement, the mortality falling to 40 per cent. and on the seventh day to 16·6 per cent.

Taking the first four weeks, there was steady improvement as time progressed, the mortality of 48·1 per cent. in the first week gradually dropping to 20·6 per cent. in the fourth week.

Taking the first four months, the mortality 32·3 per cent. in the first month fell to 11·5 in the fourth.

Roughly speaking, it seems that the protection afforded by inoculation improved up to the fourth month, the latter period being that in which it was most marked.

It must not be forgotten, however, that the later periods to a certain extent correspond to the period of the epidemic when plague became milder in character. The case mortality, total, according to these figures is 29·2 per cent., which is extremely favourable to inoculation when compared with that among the uninoculated of 67·85 per cent.

No figures are available to show how long protection lasted after the fourth month.

Nine cases occurred in those inoculated with "new" fluid between the 8th and 120th day, which may be compared with those inoculated with the "old."

"New" ... Case mortality ... 33 per cent.
"Old" ... Do. .. 24·8 per cent.

After the 120th day there were :—

"New" ... Cases ... 5 Deaths 5
"Old" ... Do. ... 3 Do. 0

Mortality in different types. — The number of cases and deaths and the case mortality per cent., in bubonic, pneumonic and septic plague are given below :—

	Cases.	Deaths.	Case mortality.
Bubonic ...	595	145	24·4 per cent.
Pneumonic ...	17	14	82·4 do.
Septic ...	73	41	56·2 do.

The bubonic figures are probably fairly accurate, the others cannot be relied on ; the village reporting agent and the people themselves probably recognize bubonic plague easily enough, but anyone but an expert would be very prone to confuse simple pneumonia occurring in an infected village with pneumonic plague, and it is also probably that some of the cases of septic plague reported, especially the mild ones, may have been malarial or other fevers.

The three cases of recoveries in the inoculated from pneumonic plague that were reported, are likely to be viewed with scepticism by those who are familiar with the fatality of this disease ; they occurred, however, in villages suffering from that variety of the disease, and, as I shall presently show, an epidemic of pneumonic plague in a family, some of which have been inoculated, has attacked the uninoculated in preference to the inoculated, so that we may consider that inoculation confers a certain protection against this variety, and if protection, why not in some cases a modification resulting in a mild attack.

The analysis of the figures of cases of bubonic plague follows, and it will be seen that they show the same variation in the protective power of inoculation as the figures relating to the total cases. Of the first four months, the fourth was the most favourable, of the first four weeks, the fourth, and of the first week, the seventh day.

Bubonic plague.	Cases.	Deaths.	Case mortality per cent.	Ratio of cases to deaths.
Before or at time of inoculation (excluded from totals) ...	23	17	73·9	1·35—1
1st day after ...	24	14	58·3	1·71—1
2nd do. ...	17	8	47·1	2·13—1
3rd do. ...	20	13	65·0	1·54—1
4th do. ...	20	5	25·0	4—1
5th do. ...	10	4	40·0	2·5—1
6th do. ...	17	7	41·2	2·43—1
7th do. ...	10	1	10·0	10—1
FIRST FOUR WEEKS.				
First week, excluding first three days ...	57	17	29·8	3·85—1
First week, including first three days ...	118	52	44·1	2·27—1
2nd week ...	104	20	19·2	5·20—1
3rd do. ...	72	14	19·5	5·14—1
4th do. ...	61	11	18·0	5·55—1
FIRST FOUR MONTHS AND AFTER.				
First month, excluding first three days ...	294	62	21·1	4·74—1
First month, including first three days ...	355	97	27·3	3·66—1
29—60 days ...	154	37	24·0	4·16—1
61—90 do. ...	60	8	13·3	7·5—1
91—120 do. ...	23	3	13·0	7·67—1
After .	3	...	...	...
TOTAL ...	595	145	24·4	4·10—1

Incidence of plague in uninoculated and inoculated.—As no correct conclusions could possibly be drawn from the total numbers, taking the district as a whole, the following procedure has been followed :—

All villages, in which a considerable percentage of inoculated have been exposed to plague side by side with uninoculated, have been treated separately to the number of 102.

In each village the average number of uninoculated and inoculated exposed daily to infection during the length of the epidemic has been worked out practically on the lines adopted by Captain E. Wilkinson, I.M.S., in his report on plague and inoculation in the Jullunder and Hoshiarpur Districts, but the number of plague cases have not been deducted, as they occurred, from the population, because it would make the calculation too complicated to deal with in the time available, and the error is small, and is in favour of the uninoculated.

Another point of error that could not be avoided, which operates very strongly in favour of the uninoculated, giving too low a percentage, was the flight of large numbers of uninoculated at the beginning of the epidemic, so that the total population uninoculated is too high, and the percentages too low.

Cases occurring within three days of inoculation have been excluded in calculating percentages among inoculated, on the grounds that they were incubating plague at the time of inoculation or had not come under the influence of the operation; on the other hand, these cases have not been used to swell the totals of cases in uninoculated.

In submitting these figures, therefore, I think I may assert that the calculations greatly favour the uninoculated, and that the value of inoculation is computed at the lowest possible figures; it is certainly not less than is shown, and probably is much greater.

TOTALS OF STATEMENT NO. 4.

Number of villages examined			102
Total population of above			161,763
Total inoculations in above			42,390
Average duration of epidemic			63 days.
Average number exposed to infection daily	Uninoculated		130,929
	Inoculated		30,834
Plague in uninoculated	Cases		11,233
	Deaths		7,888
Plague in inoculated — within 3 days	Cases		86
	Deaths		60
Plague in inoculated — after 3rd day	Cases		572
	Deaths		150
Percentages — Cases	Uninoculated		8·58
	Inoculated		1·21
Percentages — Deaths	Uninoculated		6·02
	Inoculated		·49
Ratio of cases in equal number of uninoculated and inoculated			7 to 1
Ratio of deaths in equal number of uninoculated and inoculated			12 to 1

Case mortality has already been considered, uninoculated Section A, para. 15, inoculated Section B, para. 12; this being preferably calculated from the total figures.

These figures speak for themselves and should convince the most sceptical of the value of inoculation.

The large majority of these inoculations may really be considered to be the expressed opinion of the people themselves that inoculation is good; no pressure was exercised, and, once the difficulty of doing 50 or 80 inoculations in a village had been surmounted, the remainder of the inoculations done there is the result of the establishment of conviction in the minds of the villagers that the measure, in spite of its drawbacks, temporary indisposition, and especially its failure in many instances, is, on the whole, distinctly beneficial. It will be seen that the figures are based on 42,390 inoculations, more than two-thirdsof the total performed in the district.

Calculating from the data given and condensing them into popular expression, we may say that in these 102 villages, 1,706 lives were saved by inoculation.

Below are given a few extracts from Statement No. IV for convenience of reference :—

VILLAGES.		Average number exposed to infection.	Plague deaths per 100 of population.	Ratio of deaths in uninoculated and inoculated.
Bhure Popu, 387	Uninoculated	187	10·16	...
	Inoculated ...	200	*Nil*	
Begewal Popu, 1,235	Uninoculated ...	796	6·16	27 to 1
	Inoculated ...	439	·23	
Mohanpur Popu, 903	Uninoculated ...	455	16·26	12 to 1
	Inoculated ...	448	1·34	
Shamnaggar Popu. 1,339	Uninoculated ...	422	9·24	9 to 1
	Inoculated ...	917	·98	
Makkanwindi Popu, 1,655	Uninoculated ...	990	5·25	35 to 1
	Inoculated ...	665	·15	
Munda Popu, 3,129	Uninoculated ..	1,684	7·66	9 to 1
	Inoculated ...	1,445	·83	
Phailloke Popu, 1,050	Uninoculated ...	563	7·46	18 to 1
	Inoculated ...	487	·41	
Kairon ... Popu, 2,816 ...	Uninoculated ...	1,450	8·83	13 to 1
	Inoculated ...	1,366	·66	
Mucchal .. Popu, 1,756 ...	Uninoculated ...	1,180	7·80	11 to 1
	Inoculated ...	576	·69	
Jethuwal Popu, 1,658	Uninoculated ...	1,064	5·36	16 to 1
	Inoculated ...	594	·34	

The above specimens are in no way taken because they are particularly favourable, but because a large proportion of the inhabitants were inoculated.

The death per 100 of population uninoculated and inoculated is given for comparison, the death-rate being a more accurate index than the case-rate.

Look at *Mohanpur*, which suffered a very severe outbreak, in which 16·26 per cent. of uninoculated died, and only 1 34 per cent. of inoculated.

At Sangatpura, where there were 297 uninoculated and 344 inoculated, there were 22 cases and 20 deaths in the former, not a single case among the latter. At Kot Mahmed Khan, a small village, out of 263 uninoculated, 24·71 per cent. died of plague, a quarter of their number, while 71 inoculated escaped without an attack.

At Lohar, 13 per cent. of 568 uninoculated died, while there was not a single case among 254 inoculated.

Before leaving the subject of protective value of inoculation I must mention the case of Wirana, a village in the Tarn Taran Tehsil, the only village in the district which is supposed to have been totally inoculated; this village, although in the centre of a

cluster of villages that were badly attacked, has completely escaped infection.

Infection inseparate families.—In statement No. 3 of the appendix a number of instances are given showing the protective value of inoculation, both in bubonic and pneumonic plague; a few cases are tabulated below for convenience of reference.

The Muradpore case was a very important one; it occurred at the beginning of the operations, the lumbardar of the village was inoculated at the first assemblage at Tarn Taran because he thought as an official he had better be done, the village was dead against it; when, however, the whole of the lumbardar's family died while he alone escaped, the opinion quickly changed and greatly assisted in bringing home to this portion of the district, the value of inoculation.

VILLAGE.	Number in family.	UNINOCULATED. No.	Cases.	Deaths.	INOCULATED. No.	Cases.	Deaths.	REMARKS.
Thattian ...	7	3	2	2	4	....		Bubonic.
Kairon ...	6	2	2	1	4	....		Do.
Kairon ...	7	3	2	2	4	....		Do.
Kairon ...	12	1	1	1	11	.....		Do.
Dhariwal ..	6	4	4	3	2	1	...	Do.
Waneke ...	18	1	1	1	17	1	..	Do.
Dhulka ...	4	1	1	1	8	....		Do.
Dhulka ...	9	1	1	1	8	.....		Do.
Dhulka ...	5	1	1	1	4	1	...	Do.
Mucchal ...	7	2	2	2*	5	1	...	*1 Bubo., 1 Pneu.
Botala ...	5	3	2	2	2	2	...	Bubonic.
Khalchian ...	7	4	3	3*	2	.....		*1 Pneu., 2 Bubo.
Bhindar ...	8	4	4	4	4	1	...	Bubonic.
Bhindar ...	7	3	2	2*	4	.....		*1 Pneu., 1 Bubo.
Mian Wind ...	29	9	4	3	20	.....		Bubo & Pneu.
Mian Wind ...	5	2	2	2	3	.....		Bubonic.
Khadur Sahib..	10	5	4	4	5	.....		Do.
Jaura ..	7	3	2	2	4	4	...	Do.
Phailloke ...	9	6	5	4	3	3		Do.
Phailloke ...	7	3	3	2	4	.....		Do.
Mohanpur ...	7	3	2	2	4	.....		Do.

For instances of pneumonic plague see below :—

VILLAGE.	Number in family.	UNINOCULATED. No.	Cases.	Deaths.	INOCULATED. No.	Cases.	Deaths.	REMARKS.
Sheron ...	5	1	1	1	4	.....		Pneumonic.
Sheron ...	3	2	2	2	1	....		Do.
Muradpore ...	10	9	9	9	1	...	..	Do.
Sheron ...	3	1	1	1	2	.....		Do.
Mucchal ...	8	1	1	1	7	.....		Do.
Jawandpur ...	2	1	1	1	1	.....		Do.
Botala ...	5	1	1	1	4	.....		Do.
Bhindar ...	5	1	1	1	4	.....		Do.
Jawandpur ...	4	1	1	1	3	.....		Do.
Jawandpur ...	3	1	1	1	2	.....		Do.

Future prospects.—In a large number of villages in the district there is now a strong feeling in favour of inoculation, and I hear of many villages which express a wish for reinoculation in the end of the autumn, as they say that now they see the value of the measure, they are not going to wait a second time until the disease is well established, but will all be inoculated before it begins.

Miss Gregg, L.R.C.P. & S., St. Mary's Hospital, Tarn Taran, writes on May 22nd :—"I am sure there will be a tremendous rush for inoculation here next winter in October; and I do hope there will be some provision made to meet it. We cannot undertake thousands, and whole villages will turn out for it."

I believe, if inoculation were re-started at the end of the autumn, a large proportion of the district would be inoculated without difficulty. They have had a severe lesson in this epidemic and, in those places where inoculation has been done, they recognize that, in this measure, lies their best chance of escape from another; and I consider that it is their right, now we have shown them the advantages, that staff and equipment should be ready to meet their claims.

If Government has any intention of continuing this inoculation scheme in a modified way next cold weather, I should advise an inoculation officer for each tehsil, with an able senior Naib-Tehsildar having a good knowledge of the tehsil in which he is to work, for each officer, or, better still, the Tehsildar himself to be appointed executive plague officer for his tehsil, his ordinary work to be performed by a substitute.

No preachers would be required. Our figures in this district would have been very much larger had we not been given junior candidates, new to the work, strangers to the district, and without any personal or local influence, as personal assistants to inoculating officers, for, in the absence of preachers, inoculation work depended for its success to a very large extent on the native officials with these officers.

NOTE.—The following were the antiseptic precautions adopted by me in the operation of inoculation :

1. The arm was washed with the carbolic soap obtained from the disinfection depôt.

2. A piece of lint about 2 inches square, wet with carbolic lotion 1 in 20, was put on the arm at the place selected for inoculation; this piece of lint remained on in most cases for some time until it came to the turn of the person to be inoculated when it was usually found that the carbolic had shown its action by a slight whitening of the skin.

3. The needle was sterilized by dipping it into the hot oil of Dr. Hunt's Sterilization Lamp.

4. The piece of carbolic lint was lifted off the skin, and the skin pinched up with the left hand and the needle inserted with the right.

No instance of any general or local mischief following this method.

Any persons arriving before me without the lint on the arm or with a piece that had fallen on the ground and been replaced dirty, were sent back for rewashing.

The piece of lint after inoculation was dropped into a bowl containing carbolic lotion 1—20, to be used again, otherwise the expenditure of lint would have been very large.

If any blood oozed from the puncture after inoculation, the pad of lint was reapplied and the person sent away with it.

The lubricating of the needle with the hot oil and the anæsthetic action of the carbolic both helped to lessen the pain of the operation.

C.—DISINFECTION.

1. *General remarks.*—I have very little to say on this subject, the people, at any rate in the villages, do not want it, and will not have it, principally I think on account of the trouble they imagine it involves; only two applications were made for disinfection, one from Atari, where a house was disinfected by the Hospital Assistant at the Dispensary there; the other was from a village lumbardar, who evidently thought that the application would show his zeal and knowledge;

however, when the inoculating officer had dragged tubs and heavy disinfecting apparatus over many miles of bad country roads and ploughed fields, it was found that fear had got the better of the good intentions of that lumbardar who had locked up his house and fled.

Although during the cessation of operations in November and December, the cause of disinfection was preached to the people it had no effect, and when inoculation operations were resumed, the matter was practically dropped and the superiority of inoculation preached, for could not an ordinary-sized village in a single day receive by inoculation a very much better chance of protection than from disinfection involving many days of labour and the employment of a large staff.

To expect such early reporting of the first case that disinfection can be done immediately and so effectually stop a plague epidemic, is an optimistic dream that hardly under any circumstances can be realized. To attain such realization would entail the appointment of a Medical Officer to every village with compulsory inspection of every man, woman and child in it, every morning and evening with a disinfecting staff in the village ready to act at once.

2. *Phenyle.*—Phenyle was obtained from the disinfection depôt, bottled locally, labelled with instructions and distributed to each tehsil ; all villages were informed that they could obtain it from the Tehsildar at cost price.

A certain quantity was used by the more educated, but there was no general demand.

3. *Leaflet.*—To every village information was issued in leaflet form instructing the people in simple methods of disinfection by fire, boiling water, exposure to sun, how to use phenyle, &c., and reports showed that, in many villages, the inhabitants were keen to take advantage of the advice proffered, and I believe a certain amount of good may have been done in this way ; for, while the people as a rule are frightened at the trouble and the evils that they erroneously believe to be concurrent with disinfection by Government servants, they are generally eager to learn how they may help themselves.

4. Years of experience in the Punjab have proved that the spread of plague cannot be stayed by disinfection, no treatment is of any avail in the disease, it only remains therefore to save as many lives as possible by inoculation.

D.—STAFF AND EQUIPMENT.

1. *General remarks.*—The printed list, circulated, at the commencement of operations of civil and medical officers, detailed for plague duty, enumerated a staff which would have been quite adequate for the requirements of this district.

The staff, however, actually appointed was much smaller than that laid down in the list referred to.

2. "*Preachers.*"—Two on list ; what we actually had was, Lalla Ganda Mal for a month ; Mr. Bolster, C.S., for a week or ten-days, Mr. Harcourt, C.S., for two occasions of ten days each, and Risaldar Partab Singh, E. A. C., from 1st February to the middle of April ; so that instead of two "preachers" for the whole period we, practically, had only one for about four and-a-half months.

3. *Medical Officers.*—Six on list ; what we actually had were three up to 19th January, four from 19th January to 27th February, and five from 28th February to middle of May.

The following were the Medical Officers with dates of arrival :—

Capt. S. B. Smith, I.M.S.	...	arrived 22 September.
Dr. A. C. DeRenzi ...	..	,, 23 ,,
Dr. Mayer ..	...	,, 1 October.
Dr. Heron (at Delhi from 15th Dec. to 19 Jan.)	...	,, 1 ,,
Dr. Cavanagh	...	,, 23 December.
Dr. Ellis ...	...	,, 27 February.

4. *Distribution of Medical Officers.*—Dr. De Renzi was detailed for work in the city under the Civil Surgeon, Dr. Mayer to the Ajnala Tehsil, Dr. Heron the Tarn Taran Tehsil, while I took the Amritsar Tehsi apart from the city.

This distribution was adhered to until Dr. Heron was ordered to Delhi in the middle of December. This was a severe blow, as operations were just starting again, and Dr. Heron was beginning to get known and trusted in his tehsil.

To have half my district staff removed, and tents taken away for use at Delhi and Umballa was very disheartening, the more so as I was never consulted in the matter or asked if they could be spared ; it tended to show, however, that any idea of trying to retrieve the situation and make the scheme a success had been abandoned.

Later when no work could be done in the city, Dr. DeRenzi's services were utilized in the district.

5. *Personal assistants to Inoculation officers.*—The rôle of these officials was a most important one, and the number of inoculations done depended greatly on their intelligence and ability. Junior officials with no knowledge of the work, and no personal and local influence, were useless and only resulted in the wastage of the inoculation officer to whom he was attached.

They should be senior and able men, and then "preachers" are not required.

6. *Clerks*, &c.—The staff of clerks, &c., with inoculation officers was adequate.

Equipment.—The equipment was sufficient, and the quality of the same generally satisfactory ; an exception to the latter rule was the apparatus for heating oil for sterilization, as it had apparently never occurred to the providers of the same that vessels constructed for boiling water would not stand the heat to which it was necessary to raise the oil, they were quite useless for the purpose for which they were supplied. Some of us supplied ourselves with Dr. Hunt's sterilization lamp obtainable from Bombay, which I can thoroughly recommend ; it can be used in any weather, the lamp can be regulated, and the oil kept at a uniform temperature for any period of time, and it requires very little methylated spirit ; with this lamp one could sterilize the needle before each inoculation.

The earliest date on which inoculation could be started was October 16th, and then only by two inoculating officers, the others having to remain idle till October 23rd.

As inoculation was practically stopped on November 2nd, and entirely so on November 7th it is hardly to be wondered at that the number of inoculations done in the district during the first phase of the operations was so small, under 2,000.

Tents were taken away for Delhi and Umballa in middle of November and beginning of December, and returned at end of January.

The disinfection depôt at Jullundur was run in a most business-like way, and all indents complied with great promptitude.

8. *Prophylactic.*—That the strength of the fluid varied I have no doubt, some villages reporting afterwards that hardly anyone had suffered from fever, others that the majority had had severe fever lasting two or three days and so on, and although I fully recognize the difficulties in the way of obtaining a perfectly accurate dosage, I consider that when this has been obtained and when a full dose can be given, instead of the small ones that have to be given at present in order to avoid the remotest possibility of an untoward result, we shall then have much more favourable results from inoculation that we now have.

Temperature observations, showing rise of temperature following inoculation with both old and new prophylactic, are tabulated and given in Statement 5 of Appendix. [Not printed.]

The observations are few in number, but they are all that could be obtained; for, as every effort was directed towards getting as many people inoculated as possible, officers moving rapidly from village to village, perhaps two or more in a day, were unable to take many.

A suggestion was made that inoculating officers, from their temperature observations, should restandardize the dose, increasing it when reaction was small and *vice versâ*; but in my opinion this was quite impossible unless the aim of attaining a large number of inoculations was given up and one of scientific observation substituted; both could not be done. For the restandardization would entail a large number of observations taken at least every hour to ascertain the maximum temperature reached, and would impose a very grave responsibility on inoculating officers when they should have every right to rely on the dosage marked on the bottles by the agency of supply.

After all, is it settled that the amount of rise in temperature is a correct index of the amount of protection conveyed?

Dr. DeRenzi, who has taken a considerable number of temperature observations, and carefully watched many cases, remarks that the rapidity of the pulse is increased after inoculation, and a rate of over 100 lasting some time after the operation occurs more generally than a rise in temperature, and perhaps may give more accurate idea of the constitutional disturbance produced by it.

A Mirror of Hospital Practice.

A CASE OF SPONTANEOUS RUPTURE OF THE SPLEEN.

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IN the following article I have described a case of spontaneous rupture of the spleen, as these cases are somewhat uncommon, and are of great medico-legal significance, especially to all medical practitioners in India.

Of this disease only three cases are, as far as I can discover, on record. They are given in *Lyon's Medical Jurisprudence*, 3rd Edition, by Lieutenant-Colonel Waddell, C.I.E., I.M.S.

The case I am about to record occurred in the Chumbi Valley of Tibet early in February 1904, and the details of it are as follows:—

The man was a naik driver in a Government Yak Corps by name Purba Nowgali. He was a Nepalese, and had been in Chumbi about three weeks.

He was employed at his ordinary duties up to the time of his death, and had never complained of any illness whatever during his four months service. Nor did enquiry elicit any knowledge of his having suffered from any disease on the part of his relations.

At 7 A.M., on the morning of February the 9th, the Havildar in charge of a section of the Yak Corps gave some orders to Purba Nowgali who at the time was lying in his tent. The deceased then came to the door of the tent and repeated the orders to the drivers. After having done so he lay down to sleep. He was alone in the tent at the time.

About 20 minutes past seven he called to his brother, who was a driver in the corps, and said that he (Purba Nowgali) had a pain in his side.

The Havildar and the man's brother then went to the tent. The man appeared to be in great distress, complaining of intense pain "near his heart."

The Havildar at once called a British Officer who came to the tent and looked at the man, who still complained of the pain and weakness, but made no accusation of anybody having struck him, nor could he in any way account for the pain, which he said was "near his heart."

He grew rapidly weaker, and died a few minutes before eight, about half an hour after the pain commenced.

I was sent to the camp to make a *post-mortem* examination about 3 P.M. the same day, as the cause of death was unknown; though no suspicion of foul play existed.

The man himself never complained of being injured, nor did enquiry elicit any suspicious fact concerning his death, nor any history of a fall or other injury.

On examination I found the condition to be as follows:—

The body was undisturbed and lay on its left side, the right arm was bent at the elbow, and the right hand lay over the left epigastric area. The left arm lay straight down by his side, with the hand tightly clenched. His legs were slightly flexed at the knee. Rigor mortis was extremely well marked.

After making these observations I then removed the body from the tent and examined it.

The man appeared to be well developed and powerful, about 25 to 30 years of age.

A minute examination of the surface of his body showed no sign of injury whatever. The only point that was noticed was a slight fulness of the abdomen.

A chin to pubis incision was then made. On opening the peritoneal cavity a large quantity

of blood gushed out, under the influence of considerable pressure. This was carefully evacuated and the abdominal organs examined.

The peritoneum was found to be perfectly healthy, and no adhesions were found in any part of the abdomen.

A large rupture was found in the spleen extending through the anterior angle to the hilum. The organ was enlarged to double its normal size and was very soft. Its peritoneal covering as already stated, was normal, and there were no adhesions. The rest of the abdominal organs appeared absolutely healthy.

A minute examination of the rest of the body showed nothing abnormal except a very small right sided hydrocele and a slight amount of emphysema of the lungs. The heart was healthy and not dilated.

Extreme anæmia was, of course, present especially in the brain.

In view of the above facts, this appears to be an undoubted case of spontaneous rupture of the spleen causing death.

I have recorded the case because of its great medico-legal interest, and also because the facts concerning it appear to be extremely well authenticated.

A SERIES OF FIVE CASES OF HYDROCEPHALUS.

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AT the Government Maternity Hospital, Madras, there has been a remarkable series of five cases of labour following closely one upon another, complicated with hydrocephalus. As this is a rare condition in obstetrics it is deemed worthy of record.

Details of the cases.

1. Hindu, Eddiyar, aged 20 years, primipara, admitted on December 23rd, 1903, at 3 P.M., uterus corresponds to full term. Fœtal heart audible on the right side, child found to be lying in the 2nd position on palpation.

P. V.—Cervix admits two fingers, membranes entire, head presenting high up, sacral promontory forward.

5 P.M.—Cervix can be stretched to two-fifths, pains slight.

5 A.M. of the following day.—Dilatation still the same, cervix quite loose, head not pressing on it, uterus inclined to be rigid. Fœtal heart good.

9 A.M.—As there was no progress in labour Barnes, bag No. 4 introduced and distended with water.

12 NOON.—Dilatation of cervix four-fifths. Bag removed; uterus tight. Fœtal heart getting quick.

12-30 P.M.—Under $CHCl_3$ delivery effected, the outlet was narrow and it was rather difficult to introduce the hand, but on doing so, it was found that the head was hydrocephalic, and it was then perforated, about 10 ozs. of fluid escaping. The cephalotribe was applied twice over the head, but the blades slipped on both the occasions: these were then removed, hand was passed into the uterus and a leg brought down. Considerable difficulty was experienced in making the body rotate, on account of the large size of the head; weight of child, 5 lbs. Placenta was expressed soon after delivery, as it was found to be lying at the os uteri. The cervix had split slightly on either side, and a suture was placed on each side. Examination of pelvis—sacrum much flattened, indirect conjugate 3½ inches. Patient made a good recovery; was discharged from the hospital on the 11th day after recovery.

2. Pariah, aged 30 years, 3-para, admitted into hospital on 25th December 1903, with pains which passed off after the lower bowels were emptied with an enema. On the 27th morning the pains recommenced. On examination uterus corresponded to full term, very tight. Position of the fœtus in utero not made out, but the head was felt above the brim of the pelvis, apparently large, fœtal heart inaudible.

P. V.—Cevix two-fifths, dilated, membranes entire, protruding out of the vulva, was ruptured artificially, and 60 ozs. of liquor amnii escaped. Head felt above the brim, sutures very wide; cranial bones apart, loose.

6-30 A.M.—Dilatation four-fifths. Head still high, cervix loose and hanging all round, pains feeble.

9-45 A.M.—Under $CHCl_3$ craniotomy was performed and fœtus extracted. Fluid collected from the head was 34 ounces. Placental stage normal. Weight of the child, 3 lbs. 11 ozs. Puerperal period was uneventful. Patient discharged on the 10th day after delivery.

3. Hindu, Eddiyar, aged 38 years, 8th para, admitted on 27th December 1903, at 8 A.M. Full term: fœtal heart doubtful.

P. V.—Cervix two-fifths, dilated, membranes absent, presentation head, which is felt to be large and soft, sutures very wide—hydrocephalus (?) When the dilatation of the cervix became complete, head was perforated and 40 ounces of fluid were let out. The finger was then introduced into the hole made by the perforator and with traction, the child was removed. Placental stage normal. Previous labours natural. Puerperal period was a bad one. Patient had fever from the 5th to 16th day, due probably to cystitis and lung mischief. Bases of both lungs were pneumonic, and the patient was discharged from the hospital on the 25th day after confinement.

4. Pariah, age 14 years, primipara, admitted on 9th January 1904, at 7 A.M., after having been in labour for five hours outside. On examination, uterus was tight, fœtal heart doubtful, cervix two-fifths, dilated, membranes entire, head presenting.

4-20 P.M.—Membranes absent, cervix loose, head above the brim, large, probably hydrocephalic.

5-20 P.M.—Craniotomy done and delivery effected. Fluid collected from the head 50 ounces; child's weight, 4 lbs. 4 ozs.

After delivery patient manifested symptoms of extreme shock and collapse (probably due to bleeding). Stimulants and strychnine administered, and the patient rallied. Placental stage normal.

After History.—The puerperal period was a bad one. On the evening of the 6th day after confinement, temperature went up to 104° F. preceded by a rigor. Blood examined then, no malarial parasites found, only excess of leucocytes. Lochia perfectly sweet; lungs clear.

P. V.—Pelvis quite clear, no cellulitis nor peritonitis. At the absence of any tangible cause of pyrexia, quinine was administered in large doses (10 and 15 grains), and from the 11th day, temperature came down to normal. After this recovery was uninterrupted: patient stayed in the hospital for 18 days altogether.

5. Hindu, Reddy, age 20 years, primipara, admitted on 16th January 1904, at 7-20 A.M. Has been in labour for twenty hours before admission. Membranes ruptured 9 hours ago. On examination uterus was tight, no fœtal heart sounds heard, head felt above the brim, large.

P. V.—Cervix two-fifths, dilated, head presenting high up, large scalp tumour in the pelvic cavity, offensive discharge from the vagina.

8 A.M.—Delivery effected with craniotomy followed by version: fluid from the head measured 52 ounces. Placental stage normal. Weight of child 5 lbs. Puerperal period was very much better than was anticipated during the eleven days she was in hospital; temperature was normal throughout. Lochial discharge continued to be offensive for the first six days during which time she had vaginal douches twice a day and an intra-uterine irrigation once.

REMARKS.

1. *The Incidence of Hydrocephalus.*—It is very remarkable that there were five cases in this hospital, one following so closely the other, all in three weeks' time. It is estimated by Madame LaChapelle that the frequency of such cases is 1 in about 2,900 deliveries. In the Guy's Charity Hospital, however, perforation on account of hydrocephalus was called for only once in 23,591 deliveries. In any maternity hospital, the statistics representing one particular series of morbid labour to the total confinements is not of much value, because cases which cannot be confined easily outside are at once brought to hospital. The incidence of hydrocephalic fœtuses has been very small and, as stated above, the number of cases now published is very remarkable.

2. *Presentation.*—It is stated by Galabin that in case of hydrocephalus the occurrence of presentations other than that of the head is about nine times as frequent as it is with healthy children. Pelvic presentations are generally speaking favourable, since in them by means of traction from below, the skull is more readily subjected to pressure from the sides of the pelvis in consequence of which the plastic changes are more easily effected. These presentations are for obvious reasons much commoner with a hydrocephalic than with a normal skull—about 1 : 5 (Spiegelberg). Generally in cases of hydrocephalus the head accommodates itself in the upper pole of the uterus owing to the lower relative density of the hydrocephalic to the ordinary head and in accordance with the law of adaptation. This position of the head is also cited as a proof of the gravitation theory in the accommodation of fœtus in utero. It is strangely striking that in all the above-mentioned cases, the presentation should be the head.

3. *The condition of the uterus.*—On admission all the cases presented spastic rigidity of the uterus; the uterine muscles having worked fruitlessly to force the head down into the pelvic cavity became fixed in a tetanic contraction—a dangerous symptom of protracted labour. This also explains why we comparatively often hear of rupture of uterus in these cases: the great expansion to which the lower segment of the uterus is exposed by the bulky head, which will not engage in the pelvis, must cause that segment to tear comparatively early. Amongst the 94 cases collected by Hohl and Bœhr, at least 24 (*i.e.*, 1 in 4) terminated unfavourably. Last year in this hospital there were ten cases of rupture of uterus and of these only one was a case of hydrocephalus.

4. No apparent tuberculous lesion found in the mothers.

5. In the second case there was an excess of liquor amnii, *viz.*, three pints (average being one to two pints); and the child's weight only 3 lbs. 11 ozs. Probably the development of the child was arrested on account of its deformity, and then the placenta instead of performing its normal function of nourishing the fœtus, was perverted in its function and secreted more liquor amnii than usual. Possibly this lends support to the view that liquor amnii has its chief source from the maternal portion of the placenta.

My best thanks are due to Lieutenant-Colonel A. J. Sturmer, I.M.S., Superintendent of this Institution, for his kind permission to publish these cases and for some valuable suggestions.

THE

Indian Medical Gazette.

JUNE, 1904.

DR. H. E. DURHAM'S REPORT ON BERIBERI.

THERE is perhaps no disease of the tropics about which more uncertainty exists than beriberi. We publish in this issue a short paper by Capt. Campbell Dykes, I.M.S., on an outbreak of true beriberi in a jail in Assam. To the lay mind there is nothing remarkable in the association of beriberi and Assam, but those who know the literature of the diseases of Assam well know the confusion that once existed in the nomenclature of disease in that province and how the publication by the late Sir Wm. Kynsey in Ceylon of the discovery of the ankylostomata in cases of anæmia, wrongly and most confusedly called "the beriberi of Ceylon" led to the worst confusion all over India. Therefore the fact that true peripheral neuritic beriberi has been recorded in Assam is one of considerable importance. Our attention was again drawn to the subject by reading the valuable article by Dr. H. E. Durham, of the London Tropical School Beriberi Commission, which is published in the January 1904 issue of the *Journal of Hygiene*. Dr. Durham reviews all the theories with regard to this strange disease. They are as follows:—

The physiological theory, *i.e.*, the diet or physiological starvation theory, (2) the unsound food theory, which was put forward by Prof. Uchermann of Norway, an account of which we published some time ago (*I. M. G.*, Dec. 1902, p. 480); (3) the rice theory, (4) the dried fish theory, (5) the arsenic theory, (6) the mosquito theory, (7) the cockroaches theory, (8) the fæcal-borne theory, and (9) the specific emanation theory.

We may briefly comment upon these in turn. As regards the diet or physiological starvation theory: this is also called the "nitrogen starvation theory." The fact is plain (says Dr. Durham) that in the Malay States the well-to-do escape beriberi, and those not well favoured are stricken. It appears to be a fact that "supersufficient" food does prevent beriberi, "insufficient" food renders persons liable to attack, but a "sufficiency" of food, as in the diet scales of institutions as jails and asylums, is no safeguard against attacks. It is therefore not a disease of the well-fed and well-to-do, but is a disease of coolies on contract diet, or of inmates of institutions with fixed diet tables.

Dr. Durham has surveyed the way and habits of the different races and peoples met with in the Malay States, among whom two broad dietetic distinctions can be made, *viz.*, the *wheat-eaters*, and the *rice-eaters*. Among the former (in the Malay States) are the Europeans, Sikhs, Pathans, and some Eurasians, among the latter are, the Chinese, the Tamils, the Malays, and some Eurasians. Among the wheat eaters the incidence of beriberi is extremely low, while among the rice-eaters it is certainly high.* In this connection it may be noted that we have never been able to hear of a case of beriberi among the wheat-eating peoples of Northern India, *i.e.*, the United Provinces and the Punjab. There is considerable evidence against the nitrogen starvation theory, or that the disease is due (as was said in case of *Kakkee* in the Japanese Navy) merely to a lesser amount of nitrogen in the rice diets, but Dr. Durham raises another point, when he shows that the wheat-eaters and the well-to-do obtain more *phosphorised* matters in their food than do the poorer, and it *may be* that a sufficient amount of assimilable phosphorus in the diet has the power of fending off the essential beriberi poison, and it will not be denied that a good effect results from

* Our readers may remember a discussion in these columns on the incidence of beriberi among Tamils. Tamils suffer much from beriberi in Rangoon, but comparatively less in the Malay States, except when in jail or in such institutions. It is possible that the method of preparing the rice from paddy may give a clue to this incidence. In Rangoon the Tamils probably eat "Burma rice." which is milled without the preliminary heating or steaming such as "Bengal" rice is subjected to. Burma rice, we all know, is very white and clean looking, the thin pericarp or testa being removed, but in "Bengal rice," where the paddy is soaked and steamed before husking, this pericarp and testa to a large extent remains. In Malaya the Tamils, while free, prepare the rice according to their own method, *viz.*, by steaming, but in jails, &c., they get "Siam" or "Burma" rice in which the pericarp is removed, and they suffer considerably while in such institutions, though while free men they escape. That there is something in this pericarp and testa (which is not removed in Bengal rice), which has "a sheltering effect" on the nervous system, was the theory worked out, with much evidence, by the Dutch observer Vorderman. This point illustrates how much can be said on one side, for many of the theories of beriberi, and it is worth working out in connection with localised outbreaks of the disease, as among the P. & O. Co.'s lascars and on Burma light-houses, &c.—ED., *I. M. G.*

adding peas, beans, milk, eggs, &c., to the diet.* We need not delay over the Norwegian theory of unsound meat, as tinned foods do not form part of the dietary of either Malays or natives of India.

We now come to the *dried fish theory*. Dried fish is largely used as a staple diet in the East, but though introduced as a novelty into the diet scales of the Richmond Asylum, Dublin, yet those who suffered from beriberi did not eat any of it, and in the Pudu Jail (Malay) the short-term prisoners who did not get dried fish did get beriberi. The liability, however, of dried fish to certain bacterial infections is not without importance.

The arsenic theory.—The similarity of some of the symptoms of beriberi to those of the neuritis caused by the arsenic in beer, in Manchester and other places, suggested to Ross that in arsenic, a substance of remarkably widespread distribution, might be found a cause of beriberi, but though minute traces of arsenic have been discovered in the hair and in the rice-dust eaten by beriberics, Dr. Durham concludes that the evidence is against any such theory There is also no evidence in favour of mosquitos having anything to do with the spread of this disease. The virus of beriberi, whatever it may be, has never been demonstrated in cockroaches. There is absolutely no evidence in favour of beriberi being a fæcal-borne disease.

The *theory of emanations* from specifically infected surroundings has the support of Sir Patrick Manson, but Dr. Durham's observations are against the acceptance of this theory, and as coolies or prisoners do not after all spend more than about nine hours daily in any one building, it is difficult to see how any "emanation" can be so potently evolved to produce such grave illness, and Dr. Durham concludes that ventilation has no great or real determining influence in the causation of beriberi. Dr. Durham concludes his valuable report by suggesting that (*a*) certain articles of diet, by virtue of their phosphorised and fatty matters, may tend to ward off the disease, and (*b*) it is suggested that beriberi is communicable from person to person, possibly somewhat after the manner of diphtheria, by the virus first attacking the throat, and it is noted that redness of the throat is in early stages not uncommon in beriberics. The appearances and disappearances of the disease in institutions in the Malay States and its more or less seasonal waves of prevalence remind us, *in these respects*, of the behaviour of cerebro-spinal fever in some of the prisons of India.

* One may go on elaborating theories. but it may be worth working out to what extent the pulses (*dal*) are used in the dietary of those who suffer from and those who escape beriberi. —ED., *I. M. G.*

LONDON LETTER.

THE BRITISH MEDICAL ASSOCIATION.

THE Seventy-Second Annual Meeting of the British Medical Association will take place at Oxford on the 26th, 27th, 28th and 29th of July. The attraction of this famous and picturesque seat of learning, combined with the active preparations which are being made to give its members a hearty welcome, will ensure for the Association a very successful gathering. No mistake has been made on this occasion regarding the tropical section which has already issued a programme of its proceedings. The President-elect is Lieutenant-Colonel Alexander Crombie, C.B., M.D., I.M.S., and the Vice-Presidents Brigade-Surgeon-Lieutenant-Colonel G. Maconochie, I.M.S., and J. W. W. Stephens, M.D. The subjects selected for discussion are—first, trypanosomiasis, opened by Colonel David Bruce, R.A.M.C.; second, the prophylaxis of malaria, by J. W. W. Stephens, M.D.; and third, the significance of the Leishman-Donovan bodies, by Major W. B. Leishman, R.A.M.C. These topics are perhaps the most interesting and important that could have been chosen at the present time, and the discussions ought to be lively and instructive. Sir Patrick Manson, Professor Boyce, Lieutenant-Colonel Donovan, Dr. A. Duncan, Major Mathias, Dr. Sambon, Lieut. Christophers and other well known tropical scientists are expected to take part in the proceedings of the section. Several matters of general interest are to be brought before the Representative Meeting, having been already under consideration by the sections. Among them stand prominently a proposed Medical Amendment Act, consultation by medical witnesses in medico-legal cases, and the absorption of medical defence societies and assumption of the business of medical defence by the Association.

THE PROPOSED MEDICAL AMENDMENT ACT.

This has been drafted by the Medico-Political Committee of the Association and referred to

the divisions for opinions. Its provisions are somewhat drastic. Some changes are propounded in the constitution of the Medical Council and the mode of election of its members. The number is reduced by clubbing together corporations and universities, an increased number of direct representatives elected by registered practitioners is suggested, and a dental member is included. The most drastic recommendation is the institution of a single portal final examination in medicine, surgery and midwifery by the Medical Council. The universities and corporations are still to conduct intermediate examinations leading up to this, and the Medical Council is to be authorised to appoint assistant examiners for these examinations and to control and scrutinise them, reporting to the Privy Council cases in which these examinations are faulty. The registration fee is to be increased to £1 a year, and registration is to be renewable annually. The penal provisions against unqualified practice are of a very stringent character. These proposals are made in the interests of the public to protect it from incompetent practitioners. How far the profession will support the measure remains to be seen, and even if the bill is found to be acceptable to the profession, it remains to be seen how far the representatives of the people will consent to a law which invests the Medical Council with increased power and interferes prohibitively with the proceedings and profits of the great army of quacks.

MEDICAL DEFENCE.

Several societies are in existence which, on the mutual principle, undertake the defence of members who may be subjected to legal persecution. It is suggested that the Association should on payment of a moderate additional subscription conduct the protection of individual members who may require legal aid and may not be in a position to defray the expense of it themselves. Some of these societies have gained experience and popularity in conducting this sort of business, and it is doubtful whether their members will consent to abandon these and entrust their interests to an untried agency. Unless all or a great majority of the members of all such societies agree to the change, the proposal will fall through. Medical defence can hardly be considered to be a part of the Association's general work and would necessarily be relegated to a special committee or sub-organization. There are those who consider that this kind of work is already satisfactorily done by existing special agencies, and many are prepared to declare for a continued maintenance of these. There are also members of the Association who consider such work outside of the objects and *raison-d'être* of a combination formed for purposes of social intercourse and scientific discussion. But the ethical and political concerns of the profession are being year by year brought into greater prominence by the ruling spirits of the Association, and the elements of mutual support and combined defence would seem to be as much entitled to thought and adoption as mutual improvement.

CONSULTATION OF MEDICAL WITNESSES.

The scandal of medical witnesses being retained on opposite sides in courts of law and giving what looks like partisan evidence is often the subject of remark and sneer, and it is mooted that if medical men cited as witnesses by opposing litigants were to meet in consultation before the case came into court and were to arrive at some sort of agreement regarding the fact and the opinion founded on these, much of this scandal would be avoided. The proposal is a plausible one, but it is very doubtful whether judges, juries and counsel would agree to this preliminary and private trial of the medical issues in cases, and it is also very doubtful whether, the variety of experience and judgment which must exist among the ministers of so variable a profession as that of medicine, could be reconciled and homologated by conference. And even if some sort of agreement were arrived at at such consultations and the evidence-in-chief of medical witnesses were harmonious, it is very doubtful whether this harmony could be sustained under the ordeal of cross-examination by opposing counsel. The whole practice of citing and examining experts would have to be altered, as regards medical testimony, and however taking the idea of abolishing medical contrariety and contradiction in law courts may seem to be, its realization would seem to be very difficult of achievement.

THE LATE DEPUTY SURGEON-GENERAL HENRY CAYLEY, C.M.G.

The announcement of the death of this well-known and popular officer will have taken friends, patients, and pupils by surprise. It is true that he had attained the traditional limit of human

life—the psalmist's three score and ten—but he belonged to a long-lived family and was so full of energy and vitality that it seemed as if this term would have been greatly exceeded in his case. His death was somewhat sudden, and seemed to be due to an injury of the cervical spine caused by a fall off horseback some years ago. Cayley was a most estimable man and had served the Government of India and Indian public with great distinction and, after his retirement, had done good work on the Indian Medical Board, at Netley and in South Africa during the late war. A detailed account of his career and an excellent portrait have appeared in the *British Medical Journal*. He was a clever Surgeon, and as a General and Consulting Practitioner and Ophthalmic Surgeon had held a high position in Calcutta. He was devoted to his profession and worked very hard and with great acceptation and success. He was a typical example of the many-sided Indian Medical Officer ready to set his hand to any work which came in his way. For many years he was in political employ at Leh in the Kashmir District of Ladak, and found time, in addition to his political duties, to establish a dispensary and start vaccination. When the occasion arose he undertook the teaching of tropical medicine at Netley, although his previous experience and work had been mainly surgical. The Indian Medical Officer cannot be or remain a specialist. Whatever his bias or bent he must take up any sort of professional—sometimes non-professional—work which he finds has to be done, and which he has the inclination and capacity to do. Personally he was of a most genial disposition, and none who knew him failed to like him.

THE LATE DR. MOHENDRA LALL SIRCAR, C.I.E.

I was grieved to observe a notice of the death of this gifted man lately. In a previous letter I made some remarks on his labours in the direction of the advance of science in India and the difficulties and disappointments he encountered in his efforts. Now that he has gone it would be a fitting and graceful memorial of his character, talents and energies if some institution or endowment were founded for the purpose of promoting the objects for which he strove so persistently and creditably during his life.

K. McL.

21*st April* 1904.

Current Topics.

A VETERAN'S REMINISCENCES.

WE venture to think that our readers will be interested in the following "*Medico-legal notes, reminiscent and personal*," which Colonel Kenneth Macleod, F.R.C.S., I.M.S. (retired) has recently published in the *Caledonian Medical Journal* (April). Colonel Macleod has for over 30 years been either Editor or contributor to the *Indian Medical Gazette*, and is still the Professor of Military Surgery at Netley:—

I owe my earliest knowledge of medical jurisprudence to the teaching of Dr. (now Sir) Henry D. Littlejohn, whose course of lectures at the College of Surgeons, Edinburgh, I attended during the summer of 1861. The University chair was then occupied by Professor Thomas Stewart Traill, M.D., but age and infirmity had incapacitated him for useful instruction, and his class had dwindled in consequence. He was appointed in 1832, and continued to lecture till within a week of his death, which happened at the age of 81, in July, 1862. He was succeeded by Dr. (afterwards Sir) Douglas Maclagan, whose ability, verve, and humour are so well known. Dr. Traill was a man of great and varied learning. He was sub-editor of the seventh, and chief editor of the eighth, edition of the *Encyclopædia Britannica*, and contributed to the latter some four hundred articles, some of them of great length and erudition. He had lectured on chemistry and natural history in emergencies, and until he broke down in health in 1861 he is said not to have missed a single lecture of his own proper course.

Littlejohn's teaching was most instructive, inspiring, and amusing. His class was a large one. In his capacity of police surgeon he had many opportunities of showing the practical application of the precepts and principles taught in his lectures, and he liberally used them. He also gave valuable tutorial instruction in the detection of poisons and other matters admitting of personal initiation. I retain a most vivid and grateful recollection of his lucid teaching and great kindness. I was fortunate in obtaining his gold medal, my principal antagonist in the competition being the late Dr. William Rutherford, Professor of Physiology in the University of Edinburgh. The interest in medical jurisprudence instilled by Littlejohn's teaching I have retained unabated during the whole of my professional life.

Within a week of my graduation (on 1st August, 1861) I obtained the appointment of Assistant Medical Superintendent in the Durham County Asylum. I joined forthwith, and continued to serve in this capacity for a period of three years and seven months under Dr. Robert Smith. The influence of Professor Laycock, to whom I had acted as class assistant and clinical clerk, gave me a strong bias towards this line of practice, and I enjoyed the life and work in the Sedgefield Asylum keenly. Indeed, I should have continued in lunacy had my youth and youthful appearance not prevented my selection for a superintendentship; and the attractive advertisement of the Indian Medical Service came at a time of disappointment and induced me to compete for it.

The medico-legal aspects of my work mainly concerned the technicalities of the lunacy laws. Cases of suicide and assault cropped up occasionally, as they are certain to do, under the present non-restraint conditions of asylum administration, but they seldom presented elements of doubt or interest. The doings of lunatics are, as a rule, very open, except when cunning, as sometimes happens, constitutes a feature of insanity. One case of attempted suicide has remained in my memory.

A stalwart Irish navvy became unpleasantly attentive to a Magistrate's daughter, was pronounced insane by a doctor, certified accordingly, and duly admitted as a patient. After a short residence he managed to effect his escape, and all efforts to recapture him were unavailing. One afternoon he presented himself at the entrance lodge, demanding his own clothes He was detained, and a fresh certificate and order obtained. He now developed acute suicidal propensities He tried to take his own life in a variety of ways, but unsuccessfully. He had to be watched incessantly, and was placed in a dormitory where an attendant was on duty throughout the night. One night I was hastily summoned to see him, and found him calmly lying in bed, with a ragged wound on his left wrist, and a pool of blood under his bed. He had picked up a small piece of hoop iron and sharpened one edge of it on the brick wall of the ward, and, after being put to bed, deliberately proceeded to saw his way to his pulse. He had not got deep enough when the attendant noticed the blood and gave the alarm. This was the last attempt, and many years afterwards I heard of the man as a quiet, well-behaved, cheerful, though somewhat demented, inmate of another asylum to which he had been transferred.

At that time it was necessary to obtain the consent of friends before performing *post-mortem* examinations, and an excess of zeal in this matter occasionally got us into trouble. One such scrape presents some amusing features.

J. T., a chronic maniac, who had been in the asylum for some time, fell an early victim to an outbreak of dysentery which occurred in 1864. His friends had not been very attentive to him, and, anticipating their consent, an autopsy was performed. The brain was removed and kept for further examination, and a plaster cast of the interior of the skull was taken, the material being poured through an aperture sawn out of the calvarium. The relations turned up and insisted on removing the body. A few days afterwards we read of an inquest having been held, and a verdict of death by brain disease returned on the evidence of two doctors. How they arrived at that conclusion, seeing that there was no brain to examine, was a subject of wonder to us. I met one of the doctors shortly afterwards, and he told me that the undertaker, in transferring the body to a new coffin, had detected a depressed fracture of the skull. The coroner was informed, a *post-mortem* examination ordered, and an inquest held. The two doctors who examined the body found that a *post-mortem* had already been done, that the depressed facture was a hole sawn out of the vertex; they could not find the brain, but at the edge of the hole they detected some calcareous deposit (the plaster of Paris!) adhering to the inside of the skull, and concluded that more of this deposit must have existed on the inside of the fragment that had been sawn out, and that this must have caused brain disease—fatal by irritation or compression!

On one occasion I let myself in for an unnecessary inquest. It happened in this wise. I was performing—this time with full consent—a *post-mortem* examination of a quiet dement, a private patient, and to my great surprise found a number of ribs broken on both sides. The fractures were serial and symmetrical, and there was no indication of bleeding, congestion, inflammation, or reparative action. The injuries must, therefore, have been sustained immediately before or after death, the latter more probably. I informed Dr. Smith, who reported the matter to the coroner, who decided to hold an inquest. No clue to the causation of the injury was supplied by the evidence. After describing the lesion, it occurred to me that, being alone, and finding the body in a shell, I had to tilt the box, and that the corpse slid on to the table, face downwards, landing with a thud. This was accepted as the explanation of the fracture, and, signs of mortal disease being very evident, a verdict was returned accordingly.

Shortly before I left Sedgefield a case occurred which caused considerable stir in the county, and ended rather tragically. A middle-aged exciseman (W. D.) was admitted under a magistrate's order from Houghton-le-Spring. The medical certificate was very weak, and the man showed no symptom of insanity, and was shortly discharged. His father was a quack, living at Herne Bay, who sold a nostrum for epilepsy. He placed the matter in the hands of a respectable firm of London solicitors, and an action was brought against the Magistrate, and heavy damages claimed. The case was put down for trial at the Durham assizes, but had to be postponed for want of time. Shortly afterwards a man shot himself in a field near the town of York, and was identified as W. D. This, of course, put an end to the litigation, and the suicide was claimed by the defence as a certain sign and proof of the man's insanity. Had the case gone to trial as originally intended, it would undoubtedly have been won. The man belonged to that difficult and indefinite neutral zone which separates sanity from insanity.

The district of Jessore, in Lower Bengal, to the civil surgeoncy of which I was appointed soon after my arrival in India, and where I served for a period of two years and eight months, offered abundant opportunities of becoming acquainted with the criminal habits of the native population, the action of the police, and the administration of the law in reference to personal violence. This district is a part of the Gangetic delta, and is situated to the east of the twenty-four Pergunnahs, the first territory ceded by the native ruler of Bengal to the East India Company. The northern parts of the district are comparatively high and dry, though intersected by numerous rivers, and liable to inundations in the rainy season; but the southern portions are low and swampy, being a part of the Sunderbunds which border the Bay of Bengal. The area of the district was at that time 3,658 square miles, and the population a little over two millions, the density being, roughly, one person to an acre. The area exceeded that of the West Riding of Yorkshire by 922 square miles, and the population fell short by 691,450. The civil surgeon was the only qualified medical man in this large tract of country, but he was assisted by some fifteen native doctors of sorts, some of whom were educated in Calcutta and others locally. Medical jurisprudence at that time formed no part of their training, and all cases and questions of importance were referred to the civil surgeon.

The number of *post-mortems* performed was very considerable. They came from all parts of the district, by road and boat, sometimes from great distances, the journey occupying two to three days. The bodies were wrapped up in bamboo matting, roped and slung on a bamboo pole, and carried by bearers under charge of a native constable. The condition in which some of these arrived in the hot weather and rains was simply beyond description, and presented difficulties in examination which are unknown in colder latitudes. The very first body sent to me for report was in a very repulsive state from decomposition. My native assistant suggested the usual formula of "too decomposed for examination," but I proceeded to open the body, and found a spear wound, which enabled me to certify the cause of death, and give indications of the size of the weapon, the direction and strength of the thrust, &c.

The examinations took place in the open, under a big "peepul" tree, near the jail hospital. There was among the jail guard a firm belief that the tree was haunted, and night duty in its neighbourhood was very much dreaded.

Cases of injury were sent to the civil hospital, and any report made by a native subordinate in a police case was submitted for remarks. The cases sent for autopsy presented considerable variety. Some few were accidental deaths under circumstances arousing suspicion, many homicidal, and not a few suicidal. Most of the homicides were caused by blows of the *latki* or bamboo stick, and many by agricultural and domestic cutting instruments. The majority of the suicides were by hanging, and the most of these were females. Cases of fatal

snake-bite were not rare, and fatal rupture of the spleen was not uncommon. In one such case I found marks of injury on the right side, and when I opened the abdomen I discovered that the viscera were transposed, the friable spleen lying under the contusion.

Cases of poisoning were not very numerous. The appearances produced by decomposition often simulated lesions caused by irritant poisoning and by disease. In cases where a strong suspicion of poisoning existed, the viscera had to be sent to Calcutta for chemical analysis Occasionally death was found to have been due to natural causes. In such cases the event was sometimes used as a means of accusing an enemy. Suicides were sometimes represented as homicides for the same purpose. Great caution was necessary in accepting evidence in these cases and unravelling the truth.

While unmutilated bodies often presented difficulties, mutilated corpses and fragments gave rise to great perplexities. The body may have been thrown into a patch of jungle or into a swamp, tank, well, or river, and then subjected not only to the disorganising agencies of heat and moisture, but to the attacks of mammals, birds, reptiles, and fishes as well. Sometimes a few bones in an earthenware pot or piece of dirty cloth represented the *corpus delicti*, and it happened to me more than once that these were the bones of a cow, sheep, or goat.

Cases of sudden disappearance were often associated with "finds" of this sort. A man was reported to be missing. His friends accused somebody, probably a known enemy, of murder. It was necessary to produce the *corpus delicti*, and the police were put in motion to that end. They searched jungle, and swamp, and tank, and river, and their discoveries were sent to the civil surgeon for examination and report, often with the result stated. Probably, after the plot had failed, the homing instinct drew the victim of the alleged murder back to his village, armed with some plausible lie to account for his absence.

The most remarkable search for human remains which occurred while I was civil surgeon of Jessore was after Bishop Cotton, of Calcutta, had fallen into the Gorai river, at Khustea, off a plank by which he was boarding his steamer at night. The river was the eastern boundary of the Jessore district, and the police were ordered to search the banks for the bishop's body. Some very extraordinary "finds" were reported by these industrious and imaginative officials.

Crime runs in grooves, channelled by tradition and custom, in India as regards motives, circumstances, and methods. These depend on the domestic and social habits of the people, and on the characteristics resulting from race and environment, and the provocations arising from the latter. Sexual relations constitute a very fertile source of crime in India, and agrarian disputes are a frequent cause of aggravated and fatal assaults.

In some parts of Jessore the rice land is submerged during the rainy season, and the grassy borders which separate plots belonging to different owners are apt to disappear. At reaping time boats are in requisition for cutting the crops, and boundary disputes give rise to naval engagements, the weapons being the universal *lathi* or the reaping sickle. At one time bitter disputes arose between indigo planters and *zemindars* (landowners), each of whom kept, for purpose of offence and defence, up-country *burkundazes* or *lathials*, who were armed, and came into frequent hostile conflict.

These feuds gave magistrates no end of trouble, and often supplied the civil surgeon with interesting cases. One such, associated with a standing feud between a factory and *Kutcherry* (landlord's office), which occurred shortly after I joined at Jessore, presented very remarkable features, and for a time aroused suspicion of human sacrifice. The body of a Mahomedan boy, aged about five years, was sent to me for examination. It had been found in the sacrificial room of a temple of Kali (the wife of Shiva, the destructive member of the Hindu trinity), with the head nearly severed from the body, and the neck lying in the notch of the *harikat* or scaffold used for the decapitation of sacrificial goats. I found a terrible gash in the lower part of the neck, and the vertebral column divided in three distinct places. I had no hesitation in certifying that death was caused by this wound, which resulted from three blows of a heavy-edged weapon, inflicted probably when the subject was in a lying posture. A large sacrificial knife (*khunda*) was afterwards brought, which I thought was quite competent to inflict the injury which I had described. The evidence of three blows having been inflicted was against the notion of sacrifice, for decapitation with one blow is a point of honour with the sacrificing priest; and it appeared that the first report of the tragedy was given, and that promptly, by the priest of the temple, nor did it happen that any ceremony or act of worship was in progress at the time.

The event was seized by both the *cutcherry* and factory for the purpose of accusation, but the allegations put forward by each were found to be false.

The father of the child had been seen taking him across a field in the direction of the temple. He was reported to be insane, and his wife had left him and gone to live with her brother. He was found in his house next morning with spots of blood on his clothes I examined him repeatedly, but could find no convincing indication of insanity. It is not easy, however, to ascertain whether a man talking a different language, and removed from his habitual environment, is mentally sound or the reverse.

The most feasible theory of the murder was that the father, probably unsettled in mind or actually insane, had killed the child in order to spite his wife, and had adopted the place and manner of so doing either for the purpose of concealment or imputation. The case was very carefully investigated, but the evidence was so conflicting and untrustworthy that it never came to trial. It is an excellent illustration of the difficulties often encountered in unravelling crime in India.

The mild Bengali, when under the influence of passion, is capable of inflicting savage injury. I have had frequent examples of horrible mutilations—hacking, slashing, pounding, and stabbing—and these were, in most instances, the outcome of what I may call sexual ferocity, a state of criminal excitement by no means unknown in this Christian and civilised country. One of the worst cases of hacking which I met with was that of a wife (probably unfaithful) by a cripple, who had afterwards to be accommodated with a chair on the scaffold.

As civil surgeon of Julpigoree for fourteen months (1868-69), I did not encounter any case worthy of special remark. On one occasion the police brought me three corpses—that of an old woman, a fowl, and a cobra. The old woman had been lying asleep on a mat on the floor of her hut, with the fowl roosting beside her. The latter disturbed her by cackling and jumping. She put her hand out to drive it away, and her finger was bitten by a snake. She raised the alarm, and the neighbours came and found and killed the snake. Both woman and hen died shortly afterwards, and the police packed all three in a bamboo mat, in order to support, by objective evidence, their story of the tragedy.

Justice is, or perhaps I ought to write, used to be in my day, administered in a somewhat free and easy fashion in India. When my evidence was wanted, the judge wrote a friendly *chit* (note), and when I turned up at his court I was accommodated with a seat on the bench, and my evidence recorded forthwith.

The report on medico-legal returns, which I prepared in 1870 while serving on the cattle plague commission, enabled me to display systematically, with plentiful illustrations, the most common results of personal violence in the Bengal Presidency, the circumstances under which such crimes were committed, the methods and weapons by which they were perpetrated, and the means by which they were detected. The returns were submitted by civil surgeons, under the orders of Inspec-

tor-General of Hospitals, John Murray, M.D., and related to the years 1868 and 1869. They numbered 581, and included 3,319 cases. These were carefully analysed, discussed, under separate headings, and the more important related in detail. The report was printed, and circulated to medical officers.

A subsequent series for the years 1870, 1871, and 1872, comprising 5,518 returns and 31,310 cases, was similarly dealt with by the late Surgeon-General Robert Harvey, M.B., LL.D. This report followed the earlier closely in method, and the conclusions drawn in the latter were confirmed and expanded, the more abundant material at command giving scope for ampler detail. Dr. Harvey's report was published in the *Indian Medical Gazette* during the years 1875 and 1876, and subsequently issued in separate form. The first report was similarly printed in 1875. These reports constitute a mine of interesting and valuable medico-legal material, from which subsequent writers on medical jurisprudence in India have liberally drawn.

When I came to this country on furlough in 1876, I brought home with me a large cask of later returns, intending to work them up into a third report; but I found the labour too arduous, and, though I took them back to India with me, I never found time to complete the work, and the submission of the returns had meantime been discontinued. I doubt whether a subsequent compilation would have yielded much additional knowledge in the shape of general conclusions, though doubtless many interesting cases might have been selected from the contents of the barrel.

In the year 1870, a very important work on Indian Medical Jurisprudence was published by Dr. Norman Chevers, of the Indian Medical Service, Principal of the Calcutta Medical College. Chevers was a man of great culture and ability, indefatigable industry, very retentive memory, and most philosophical mind. His book was not a mere treatise of technical legal medicine, but a vast and orderly repository of facts bearing on the psychology of crime and criminals.

I was asked to write a review of the work for the *Calcutta Review*, and undertook the task as a labour of love. I endeavoured to extract from Chevers' teeming and thrilling pages the leading principles of psychopathy—to show that the commission of crime springs from natural instincts and motives and normal social energies, and that crime is simply disordered psychology, just as disease is disordered physiology.

Another subject which engaged my attention later on, as an outcome, no doubt, of these speculations, was suicide. I collected statistics and information from all parts of India, and on 13th June, 1878, read a long paper on the "Statistics and Causes of Suicide in India" at a meeting of the Bengal Social Science Association. The statistics related to the five years 1872-76, and they established some curious conclusions regarding the prevalence of suicide in different parts of India, and the methods by which it was accomplished. Facts were also recorded as to the circumstances and motives which induced men and women to take their own lives.

I was appointed to the Medical College, and entered on consulting and general practice in 1879. Thenceforward I was frequently asked to give an opinion in medico-legal cases, and summoned as an expert witness to courts both in and around Calcutta. The cases were of very varied character, and in the press and rush of work I made no note of them; but there was one, which presented features and results of very exceptional importance, of which I retain full details. The particulars were as follow:—

A well-developed and well-nourished native girl, aged, at the time of death, 11 years 3 months and 14 days, was married to a wealthy Hindu (one Harry Mohun Maity, an Ooriya Kyast), aged 35 years, on 11th May, 1890 (age, 11 years 2 months and 9 days). She went to his house, according to custom, the next day after the marriage, and stayed eight days with him, and again after two days, for part of a day. Her husband came to see her at her mother's house at the Snan Jattra (3rd June), and stayed three days, and again on Sunday, 15th June. The girl went to sleep with her sisters in a corridor, and about 1-30 of the 16th her cries were heard coming from an adjoining room, which her husband occupied. She was found lying on a charpoy (stringed bedstead), weltering in blood, the husband kneeling beside, his clothes blood-stained. A doctor saw her about 6-30 next morning, and found her labia a little swollen and a clot in her vagina. She was moribund, and died at 3 P.M. the same day (13½ hours).

On *post-mortem* examination next morning, the following facts were noted:—Body well nourished; mucous membranes pale; no hair on pubis; breasts beginning to be prominent—not developed; no external mark of injury; no abrasions, wounds, or bruises about the genital organs; internal organs healthy, with exception of œdema at base of left lung; all organs exsanguine; a clot measuring 3 inches by 1½ inch in vagina; vagina smooth and dilated, length about 3 inches; no hymen or fourchette; no rugæ; a longitudinal tear, 1½ inch long and 1 inch broad, at upper end of vagina to right of os uteri; a hæmatoma, 3 inches in diameter, in the right broad ligament; uterus and ovaries small and undeveloped; no sign of ovulation.

Dr. Cobb, the police surgeon, deponed that death was caused by exhaustion from bleeding due to injury sustained during sexual intercourse. The case came for trial at the Sessions Court of Calcutta, Sir Arthur Wilson presiding. The accused was found guilty (by a jury composed of six Hindus, one Mohamedan, and two Europeans) of inflicting grievous hurt through committing a rash and negligent act, and sentenced to one year's rigorous imprisonment.

I was called as an expert in this case, listened to all the evidence, and strongly supported Dr. Cobb's conclusion. The "age of consent" had been fixed at 10 years by the Indian Legislature, and this was the law at the time of the trial. The case aroused a strong feeling that, for the protection of immature girls, it ought to be raised, and an agitation arose immediately to that end.

The custom among Hindus, sanctioned by their religious and social traditions, is to marry their daughters before the period of menstruation, which is held to be a sign of sexual maturity and nubility, and it is held to be a disgrace for the function to make its appearance before the contraction of matrimony. The consummation of these early marriages is supposed not to take place until the function has commenced; but this rule is frequently, if not habitually, disregarded. Indeed, this was urged in defence by prisoner's counsel; and the absence of fourchette and hymen in this particular case indicated either previous sexual intercourse or the employment of artificial means of dilatation, a disgusting practice said to be frequently resorted to.

I threw all my energies into the movement for raising the age of consent. I edited the *Indian Medical Gazette* at the time, and wrote a strong leading article, pointing out how frequent similar cases were in India, even under the legalised sanction of marriage, and how degrading and injurious to the individual, demoralising to the community, and harmful to the physical welfare of the race the debauching of young girls and early matrimony were. As president of the Calcutta Medical Society I read a paper of the same purport, and initiated a discussion which occupied three meetings, and led to the following resolutions, unanimously passed:—

1. In the opinion of the Society the mere appearance of the first menstruation does not necessarily indicate the full development of the organs of generation.

2. The custom where it exists of exposing girls to the risk of becoming mothers as early as possible after the appearance of menstruation is unphysiological, and injurious to the welfare of the mother and offspring, and therefore to the race.

3. A girl is not competent, physically or mentally, to give her consent to sexual intercourse until she has completed 14 years of age.

Resolutions to the same effect were passed by the Calcutta Health Society, of which I was president. A Bill was brought before the Supreme Legislative Council to raise the age of consent from 10 to 12 years, and became law on 18th March, 1891. On this the *Indian Medical Gazette* recorded the following remarks :—"We heartily welcome the measure as a means of rescuing a very defenceless section of the community from physical suffering and moral degradation; but the evils entailed by premature maternity still remain. These must be remedied by the people themselves. Advancing education and civilisation are the agents effective for this purpose; and we hail it as a good and hopeful sign that real reformers in India do not consider the present measure as going anything like far enough in the direction of discouraging or preventing a female from becoming a mother until she is physically, intellectually, and morally fitted for discharging the duties of maternity."

The extraordinary part of the matter was that this Age of Consent Bill raised a storm of opposition in the native press and native community. I shall never forget one foggy evening witnessing a mass meeting to protest against it, in the centre of the Calcutta race-course. Crowds of natives, of all conditions and ages, flocked to this outdoor demonstration, the proceedings of which I could only watch at a distance. They were all men!

The last case with which I was connected in India was a very singular one. A young German, an assistant in an indigo factory, was shooting ducks on a tank, and fired at one. A native doing some work at the edge of the tank got frightened, and jumped into the water. He did not reappear, and his comrades proceeded to search the place, and eventually recovered the body. They noticed wounds on the face, and informed the police, who sent the body to be examined by a native doctor. This man certified that the cause of death was gunshot wound of the orbits. The case came for trial before a native Deputy Magistrate, who convicted the prisoner of manslaughter, and sentenced him to a smart term of imprisonment. An appeal was promptly lodged, and was in due course heard by the Sessions Judge of Burdwan. The native doctor's report was sent to me for opinion, and I found that in order to produce the injuries described the pellet or bullet must have entered one orbit, jumped out, and entered the other, and failed to penetrate the bones or effect a lodgment. I journeyed to Burdwan in company with my friend, Mr. Robert Allen, barrister-at-law, who conducted the defence. He elicited that in raising the body from the bottom of the tank, which was thickly covered with tenacious weeds, the natives had used a bamboo pole, forked at the end, and an inspection of this indicated the probability that the orbital wounds described were caused by these prongs. The judge accepted this view, and reversed the judgment of the Deputy Magistrate. Thus happily ended my medico-legal experiences in India."

CHLOROFORM IN HOT CLIMATES AND IN HOSPITALS IN THE FIELD.

THE April number of the *Royal Army Medical Corps Journal* contains a report by Dr. F. W. Tunnicliffe, the Professor of Pharmacology in King's College, London, on certain specimens of chloroform which had been used in the late war in South Africa.

It may be remembered that a few deaths from chloroform were reported during the course of the war, and there was a suspicion in one or two instances that the chloroform had deteriorated owing to some subtle changes, the result perhaps of heat, climate, or other conditions incidental to active service. There was no doubt about the original purity of the chloroform, as it was prepared from ethylic alcohol and was sent out in the original bottles bearing the name of one of the leading manufacturers of this article.

The object to be ascertained by Dr. Tunnicliffe's experiments and research was whether any of the chloroforms submitted differed in their toxicity from the purest chloroform obtainable commercially. The method of examination was to submit a biological unit, *viz.*, a cardial muscle to the various chloroforms concerned, and to compare in each case its behaviour under their influence to its behaviour under the influence of the purest chloroform obtainable commercially. The chloroforms examined were divided into (1) those which were supposed to be the cause of dangerous symptoms, or death during the course of anæsthesia produced by them, (2) those in which considerable evaporation had taken place, (3) those which had been submitted to exceptional transit, (4) those derived from methylated spirit, and (5) those of considerable age.

From the results obtained, Dr. Tunnicliffe is able to formulate the following conclusions :—

"(1) No chloroform submitted to and examined by us differed in its toxic action upon the heart from pure chloroform.

(2) The residue of those chloroforms which had undergone partial evaporation did not differ in its toxic action from pure chloroform.

(3) The residues of pure chloroforms (B.P.) artificially evaporated in the laboratory by violent means did not differ in their toxic action from the original chloroform.

(4) From the last conclusion it may be inferred that pure chloroform containing a small percentage of absolute alcohol, as directed by the B.P., will remain free from pharmacological deterioration under the ordinary conditions of military transit. It would seem, however, advisable to keep chloroform during transit from exposure to strong light in closely stoppered bottles, and in as cool a place as possible. It must, however, be remembered in connection with these suggestions, that by no manipulation of the kind likely to be met with during military transit were we able to affect the toxicity of an originally pure chloroform."

THE VARIETIES OF STOOLS IN DYSENTERY.

THE following useful description of the stools in cases of dysentery is taken from an article in the *Edinburgh Medical Journal*, April 1904. It is by Dr. Andrew Duncan, I.M.S. (retd.), now on the staff of the London School of Tropical Medicine.

"The following varieties of stools may occur in dysentery :—

1. *The stool of the milder forms.*—Here first of all a solid motion may be passed covered

more or less with greyish or colourless mucus. This is succeeded by the passage of small quantities of offensive mucus, with minute fæcal lumps. Then there are passed mainly small quantities of mucus stained with fæcal matter, and often mixed with blood. And, withal, occasionally scybala are passed at intervals.

2. *In a more severe form.*—After the bowel has discharged its contents, often solid, we find whitish or coloured jelly-like mucus, quickly becoming bloody, with often pretty large quantities of clotted blood. The motions are frequent and of about two to three drachms in quantity. This, *the mucous or muco-sanguineous stool,* forms a slightly yellowish, glaring quivering mass lying in balls or clumps, without any fæces, or perchance around a formed mass of fæces. If the discharge be very fluid, the masses of mucus unfold into hyaline shreds.

3. *The sanguineo-purulent stool.*—Here in a small amount of yellow fluid, generally without fæces, float a number of reddish lumps as large as a pea or bean, in appearance resembling raw meat. Pieces of mucous membrane can at times be found in this variety of stool.

4. *The purely bloody stool* results either from superficial or deep ulceration.

5. *The simple purulent stool.*—This results from the formation either of submucous abscesses, or from the mucous membrane being destroyed. The pus is either pure and odourless, or mixed with fæcal matter and blood.

6. *The so-called frog's egg stool,* consisting of clumps of tough mucus. Virchow holds this form may sometimes arise from the ingestion of starch food. Another view is that the mucus which has been secreted late in the disease is pressed into the cavities, out of which the follicles have fallen, and then subsequently falls out again into the cavity of the bowel, retaining the shape into which it has been moulded in these follicular cavities.

7. *The pulpy stool,* described by Sir Joseph Fayrer, is very offensive, occurring without blood or mucus.

8. Sometimes we find, *with the ordinary stool of dysentery,* that from time to time the patient will pass throughout the course of the affection, *fluid fœcal matter.*

9. *The gangrenous stool.*—Here a blackish or blackish-red fluid is passed, with a horribly putrescent penetrating odour, containing pieces of gangrenous tissue. Tubular structures may be found in the discharge, which by some are held to be separated portions of the intestinal wall. Heubner, however, holds that they consist only of mucus.

10. *The stools of amœbic dysentery.*

11. *The stools of chronic dysentery.*—These vary much in character. They are thin, watery, of varying colour, and may be very offensive. Mucus, blood, and pus are mixed in different combination. Sometimes the blood is so intimately mixed that the whole stool is of a brownish or darkish colour.

THE DIGESTIBILITY OF VEGETABLES.

WE extract the following from the *Edinburgh Medical Journal.* "Bryant and Milner have investigated the digestibility of some of the commoner vegetables. On three healthy subjects the digestive value of potatoes, cabbage, beets, apple sauce, and green corn was determined. The plan pursued was the following:—A diet of meat, bread, butter, milk, and sugar was chosen, and it was found out, by actual experiment for each subject, what quantities of these substances were most agreeable to him. The ratio was then fixed of the various ingredients, and for three days each subject lived on his chosen diet. By analysis of the urine and fæces, the digestibility of such basal ration was fixed. To it was then added as much of the chosen vegetables as the subject could take. As far as possible no alteration was made in the basal ration, and if any such alteration was required, all the constituents of the diet were reduced proportionately. In actual practice, it was found necessary to make only very slight alteration in the basal quantities. It was assumed that the basal diet was digested to the same degree with and without the vegetable, and any alteration in excreted material was put down to the vegetable factor, and in this way an indication of the digestibility of the vegetable was obtained. The authors found that only a very small portion of the protein in cabbage was digested. On an average 82 per cent. of the available carbohydrates was digested and utilised, and probably about 57 per cent. of the total energy available in the cabbage was utilised. For potatoes about 73 per cent. of protein and 99 per cent. of the carbohydrates appeared to be digested, representing 94 per cent. of the total available energy. The digestibility of the beets was also high; for protein 72 per cent., for carbohydrates 97 per cent., and 90 per cent. of the total available energy was contained in the digested material. The protein of apple sauce was poorly digested, but the carbohydrate value represented 99 per cent., and apparently the digestible portions constituted 99 per cent. of the total energy of the sauce. The authors conclude that the vegetables included in this series of experiments, so far as fat and proteids are concerned, are of little value. The carbohydrates they contain are quite well digested and absorbed, and to this extent they act as sources of energy. The chief value of many vegetables is due, apart from this, to the variety and palatability they give to the diet and to the bulkiness given to the food. They also furnish organic acids and mineral salts, and may also favourably affect the digestion of the other food stuffs."—*Am. Journ. Physiol.*, Boston, October 1, 1903.

THE MENTAL AND MORAL EFFECTS OF WAR.

IN a valuable article in the *Journal of Mental Science* for January 1904 (see *Practitioner*, p. 565), Dr. R. S. Stewart, the Deputy Superintendent of the County Asylum at Glamorgan, studies what he calls the mental and moral effects of the South African War. He considers that the war produced a profound, immediate, but non-permanent modification of the national character and conduct. He divides the campaign into three periods, the first up to the black week in December 1899, the second in which the national stress was relieved by the success of Lord Roberts, the third was the long period from the occupation of Pretoria to the peace. In the first period the feelings engendered by the war were tensely painful, but there was no despondency, but a spirit of determination to overcome the difficulties. In the second period there was feelings of joyousness carried even beyond the verge of abandonment. In the first period, Dr. Stewart shows that there was a marked change in the national characteristics, criminal propensities were checked, and there was manifest a lessened disposition to self-indulgence, and a lessened disposition to shirk the troubles and responsibilities of life. The mental stability of the nation was improved and its power of self-control increased, in fact an unmistakable improvement in the national *morale*. Gradually these effects passed away, and within a year there was a return to something even worse than the previously prevailing conditions, and the reaction has proved and is likely to prove, thinks Dr. Stewart, productive of the gravest results.

LEPROSY IN JAMAICA.

DR. W. D. NEISH and Dr. T. J. Tonkin published an interesting paper on Leprosy in Jamaica in the *Bristol Medico-Chirurgical Journal* (March 1904).

We note that they consider that this disease is decreasing in Jamaica, and the proportion to-day does not exceed 4 per 10,000. The Island has an admirable leper house, and the decrease in the amount of the disease is attributed in part to the influence of this institution.

The authors say, "in common with many other parts of the world that are leper-smitten, the diet of the Native Jamaicans is markedly deficient in nitrogenous elements; the general condition of the people and with it the diet is, however, improving." The small balance of evidence appears to indicate that there is no relation between fish eating and leprosy. The treatment of the disease by intra-muscular injection of perchloride of mercury is of value, combined with good feeding and general attendance. The authors regard leprosy as a disease which in many instances is capable of sound cure, chiefly by dietetic means. So much will be agreed in India. We have always maintained that a worn out and cachectic leper can be made into a healthy, comfortable and well fed leper, but we are not yet convinced that the disease can be eradicated from the system. In this connection we may draw attention to the paper by Captain Rost, I.M.S., in our May issue. We understand that Captain Rost is prepared to supply Leprolin to any medical man wishing to try its effects in the cure of leprosy.

HYDRO-CARBON AS A PLAGUE-GERM DESTROYER.

WE have received a pamphlet from Dr. E. S. Chenai, L.R.C.S. (Edin.), the Chief Medical Officer of the Southern Mahratta Railway, on the subject of hydro-carbon as a destroyer of the germs of plague.

Hydro-carbon is described as "a waste product of the manufacture of oil gas," and is a straw-coloured fluid of pungent odour, which is freely volatile, but does not mix with water. It burns freely when ignited. It is in fact very inflammable, but does not ignite spontaneously. The heat and smoke generated by its combustion is so great, that "vermin and germs" are said to be quickly destroyed, and its odour is peculiarly obnoxious to rats. It is claimed that if a stick and rag dipped in hydro-carbon is ignited the smoke and heat will penetrate every nook and cranny of a room. The room must be lightly closed and everything wooden or inflammable must be removed.

It is probable that this somewhat dangerous substance would be useful in killing germs and vermin in *pucca* masonry rooms, or in buildings with lofty ceilings, but it would be most dangerous to use in buildings with wooden floors, or paper covered walls, in buildings with ceiling cloths or matting in thatched houses, or in temporary buildings made of matting or other combustible material.

Its sphere of usefulness is thus very greatly limited, and it is not probable that such a dangerous substance will be largely used for disinfection, though in suitable places it is probable that it would be useful and effective.

WE direct attention to the note published in this issue by Major Adie, I.M.S., Civil Surgeon of Ferozepore, in which he shows the value of the green scum on tanks, consisting of the aquatic plants *Lemna minor*, in preventing the breeding of mosquitoes.

We are informed by Major Prain that the lemnaciæ abound in the tanks of Bengal. There are several species of lemna, but *l. minor* is not the commonest in Bengal. Two species of Wulffia also are found in green tanks. These are simple plants, but are not very low down in the scale, for they are monocotyledons.

In still weather doubtless such a coating would prevent the breeding of mosquitoes, but it so often happens that in portions of a tank there is clear water, owing to the action of the

winds, and in these clear portions mosquitoes would breed as usual. Major Adie's observation will explain the fact that the foulest-looking green tanks are not the worst in mosquito-producing.

THE tropical section of the British Medical Association Meeting has, ever since its inception, been a pronounced success, and to judge by the programme announced for the July meeting this year will be equal to any of its predecessors. The following subjects have been selected for discussion: —(1) Trypanosomiasis—to be opened by Colonel Bruce, F.R.S., R.A.M.C.; (2) The Prophylaxis of Malaria by Dr. J. W. W. Stephens; (3) The Significance of the Leishman-Donovan bodies by Major W. B. Leishman.

The following gentlemen have promised to take part in the discussions:—Sir P. Manson, Professor Boyce, Major C. Donovan, Dr. Andrew Duncan, Major Mathias, Dr. L. Sambon, Captain E. P. Sewell, Captain Anderson, Captain S. P. James, Lieutenant S. R. Christophers and Dr. Sandwith.

IN the April number of the *Practitioner* Dr. F. M. Sandwith gives an appalling picture of the state of the prisons in Egypt only ten years ago, when typhus was endemic in them, generated and kept alive under indescribable conditions of filth and want of ventilation. Things have greatly changed in Egypt since 1894.

It is curious that in his account of typhus in Egypt no mention is made of cerebrospinal fever, for it may be remembered that what was called typhus in Khartoum, under the old regime, proved on the British occupation to be cerebrospinal fever.

A DISCUSSION on keloids, or raised scars after vaccination, has lately been going on in the *British Medical Journal*. They are very common in India in the scars after vaccination. They are disfiguring, but otherwise harmless. Their causation is not known.

IN an article on the anti-malarial campaign in Mian Mir Lieutenant-Colonel G. M. Giles, I.M.S. (retired), says, "I maintain that the retention of canal irrigation within the limits of any military cantonment a day longer than can be avoided is little short of criminal."

WE are very glad to hear that the Amir of Afghanistan is desirous of having an officer of the Indian Medical Service permanently stationed in Kabul. This is quite in accordance with the old traditions of the Service, and we hope that the Government of India will see their way to appoint an officer.

We are glad to note that Major R. Bird's visit to Kabul has been such a success.

RULES for the sanitary regulation of slaughter-houses in municipalities are published in the *United Provinces Gazette* for 23rd April 1904.

IN *American Medicine* (March 12th, 1904), Dr. Rutherford recommends the use of olive oil in cases of chronic dysentery and diarrhœa. We tried the method some years ago with but varying success. Dr. Rutherford begins with 30 c.c. (about 1 oz.) of the oil thrice daily for three days, then 60 c.c. thrice daily for three days. after sixth day he gives 60 c.c. four times a day. For the first few days the patient gets milk diet only, then added to it 3 oz. of scraped beef or of egg-albumin. In the second week 90 c.c. of oil are given thrice daily and kept up for a couple of months, the patient being gradually restored to full diet. Later on it is said a relish for the oil comes. No doubt for chronic dysentery and for sprue such treatment will in the end be beneficial.

WHEN electric fans were introduced into Calcutta, the wits invented a term for a new disease, *fanitis*, which was supposed to result from sleeping under these invaluable fans; now we read of a new nervous malady called *motorpathia cerebralis*, which is supposed to be the result of the jolting and swinging of the motor car as it flies along.

THE *Edinburgh Medical Journal* announces that arrangements are being made for improved practical teaching of midwifery in Edinburgh. A Commission some few years ago reported that some medical students there had to attend no less than 250 lectures on midwifery, but that means for practical education were lacking.

UNDER the Carnegie Trust seventy applications for post-graduate medical research in Scotland were favourably received and a total sum of £3,524 apportioned.

IN Dr. Nicolas Senn's *Surgical Notes*, we find it mentioned that in Cairo Dr. Wildt has the following results from his operations on liver abscess:—Mortality of first hundred cases, 38 per cent; second hundred, 32 per cent; third hundred, 20 per cent. It is claimed that the increasing good results are due to increased experience, but in liver abscess much will always depend upon the stage of the disease when the operation is done.

WE call the attention of our readers to the admirable and interesting account of the great fight with plague in the Punjab in 1902. It gives a good account of this great sanitary effort, which came to an untimely end by the disastrous accident at Malkowal. 'Tis true, 'tis pity, &c.

MAJOR W. E. JENNINGS, I.M.S., M.D., D.P.H., has been appointed Associate Editor for Bombay to the *Indian Medical Gazette*. The three Presidencies and Burma are now represented on our Editorial Staff.

THE monthly *Ophthalmic Review* which was founded as a quarterly in 1864 by Lawrence of London and Windsor of Manchester has, since January 1904, altered its scope and appearance as well as increased its editorial staff. Reviews as always form its main feature, but more elaborate original communications and a complete bibliography of all ophthalmological monographs are noteworthy improvements. Communications intended for the *Review* may be sent to the Editor, Dr. W. G. Sym, Edinburgh, or to Major F. P. Maynard, F.R.C.S., I.M.S, who is Assistant Editor for India. The publishers are now Messrs. Theratt and Hughes of London and Manchester.

THE new ophthalmic paper, *The Ophthalmoscope*, which recently started in London, with Mr. Sydney Stephenson as Editor-in-Chief, has Major H. Herbert, F.R.C.S., I.M.S., the Ophthalmic Surgeon, Bombay, as representing it in the East. The publishers are Messrs. G. Pullman & Sons, London.

Reviews.

Lectures, chiefly Clinical and Practical, on Diseases of the Lungs and Heart—By JAMES ALEXANDER LINDSAY, M.D., F.R.C.P. (Lond.), M.A. London: Baillière, Tindall & Cox, 1904. Price 9*s.* nett.

THE scope of this work is explained in the preface as follows:—"The lectures, though not systematic in form, are intended to raise and discuss most of the problems of diagnosis, prognosis and treatment which confront the practitioner in the field of thoracic disease."

The book begins with a lecture on diagnostic method in which the relative merits and demerits of the serial and direct methods of examination are discussed, followed by another on the interpretation of history in disease.

Having thus cleared the way, the author gives a series of admirable lectures on diseases of the lungs, beginning with two on the physical examination of the lungs and pleura, which are very complete, and which afford a reasonable explanation of the mode of production of the various physical signs. The chapter ends with a syllabus of the auscultatory signs, as they are found grouped in the various diseases of the lungs and pleuræ. Next pleurisy is considered, first in its relation to tubercle, and subsequently in its problems of differential diagnosis. There is, however, no reference in this connection to abscess of the liver, an omission which will be a subject for regret to practitioners in the tropics. Prognosis and treatment, including aspiration and its rare dangers, are fully taken up, and the question of empyema touched upon.

A valuable chapter follows on the early diagnosis of pulmonary phthisis considered from the point of view of history, examination of the sputum with its fallacies, the mode of onset, the symptoms, and the physical signs, including the valuable aid given in the early stage by radioscopy. Next are passed under consideration three groups of conditions which may simulate pulmonary phthisis, with valuable hints as to diagnosis; and following this a chapter on prognosis in phthisis. The treatment of this disease is thoroughly gone into the next two chapters under the headings of preventive, specific, antiseptic, hygienic, symptomatic, and climatic, the last being, within the limits assigned, considered with striking lucidity. A useful chapter follows on the causes and treatment hæmoptysis, and another on some of the rarer forms of pulmonary disease, and lastly, so far as the lungs are concerned, one dealing ably with the treatment of pneumonia, empyema and asthma.

Following on these admirable lectures on diseases of the lungs, the first few of those on diseases of the heart are distinctly disappointing. Their tendency appears to be too greatly in the direction of the formation of lists of conditions under which certain phenomena are found, without any attempt to correlate them to common causes; nor can we agree with the author in considering the short pause in the heart undeserving of attention, the accentuation of the pulmonic second sound of no value in estimating the amount of mitral disease, and the pitch of the cardiac sounds without definite clinical value under certain conditions. A chapter on the study of cardiac symptoms is a good one, and that on disorders of cardiac rhythm contains an excellent account of tachycardia and brady cardia, though it is curious that no mention is made of digitalis as a cause of coupled rhythm. The next chapter on diagnostic problems in heart disease is one of the best in the book, and is followed by one on prognosis in chronic valvular disease, in which scarcely enough stress seems to be laid on the immunity from danger of sudden death in mitral disease, so long as there are no symptoms pointing to dilatation and failure of the right ventricle, in contrast to the ever-present danger in all but the slightest cases of aortic regurgitation. The last chapter is on the treatment of valvular disease of the heart.

The author's remarks on the indications for digitalis are very sound. He prefers to administer the drug in the form of pills containing from a grain to a grain and a half of the powdered leaf with extract of gentian, this amount being given two to four times daily; a few grains of calomel or blue pill are given every three or four days, the whole course being continued for four to six weeks,

and followed by a temporary suspension of the drug. The author has no knowledge of decided cumulative effects from the use of the drug. Every chapter is headed by a full synopsis of its contents, tabularly arranged; a detail which adds definitely to the value of an already valuable book.

A Manual of General Pathology for Students.—By SIDNEY MARTIN, M.D., F.R.S., F.R.C.P., Professor of Pathology at University College, Physician to University College Hospital. Price 15 shillings. Publishers: John Murray, Albemarle Street, London.

THIS new text-book on General Pathology has for its basis the lectures on this subject delivered at University College during the past five or six years. "It attempts to give in a short space a clear account of the processes of disease which it is necessary for the student to appreciate in order to follow the study of scientific medicine."

We may say, before proceeding further, that the author has fully attained the aim he sets before himself in his preface, and has succeeded in producing a book which reaches a very high standard of excellence and a work which should be of the greatest value to students in the study of medicine. The author shows on every page a thorough grasp of his subject as well as the facility of stating his views clearly and condensing his knowledge into a lucid account of the processes of disease.

The book is well got up, the publishers deserving all praise. It is clearly printed on good paper, and the numerous woodcuts from microphotographs are excellent and enhance the value of the production.

These woodcuts illustrate the text in a peculiarly suitable manner, and are of the greatest service in giving a clear and definite conception of the meaning of the text.

The book is divided into nineteen chapters, four chapters are devoted to the study of infection; three to the study of the changes in the blood in disease; two to the changes in the circulation in disease, and one to each of the subjects, inflammation, pyrexia, degeneration and regeneration of cells and tissues, hæmorrhage and pigmentation, diseases of liver, diseases of kidneys, diseases of ductless glands, changes in metabolism, and lastly, a chapter on the changes in the nervous system in disease.

The chapter on inflammation gives a very clear and succinct account of the different changes met with in inflammation and the effect of these changes on the different cells and tissues of the body. We also have an account of the varieties of inflammation with a full description of inflammation in non-vascular tissues and an account of phagocytosis. The subject-matter of this chapter is probably the most important in the medical curriculum, as without a thorough grasp of inflammation and the changes that take place in the tissues during inflammation, the student will always feel handicapped in his after-studies. Considering how very important the subject is, we do not think too much space has been devoted to it. The illustrations in this chapter are exceedingly good, and assist greatly in forming a mind-picture of the morbid processes.

Of the chapters on infection, the first deals with the infective agent, giving a classification of parasites and micro-organisms. There is also a very useful table of the different characters of the bacteria causing specific diseases.

The second chapter on infection deals with the chemical products of bacteria, the action of these products and more particularly with the action of the products of pathogenic bacteria, *i.e.*, the toxines of disease. This chapter is most interesting reading, and gives a clear account of the products of the individual pathogenic bacteria, with a résumé of the general action of bacterial poisons, and a table showing the comparative toxicity of the chemical products discussed.

The third chapter on infection describes the infective process as it occurs in man. The article on tuberculosis is excellent and is beautifully illustrated—a series of five coloured plates showing the spread of the disease under different conditions.

Thirty-six pages are devoted to an interesting summary of what is known regarding immunity, with an account of Ehrlich's theory of antitoxin formation and action.

Two chapters are taken up with the circulation, the first deals with the changes in the circulation in disease, the second with œdema and dropsy. The perusal of these chapters gave us the greatest pleasure. The subject is treated in a masterly manner by one a thorough master of his subject, showing an immense knowledge and acute observation.

Respiration and the blood are done in an equally satisfactory manner, and will repay careful perusal.

The chapters on the liver and kidneys give a good synopsis of the result of the mass of experimental work that has been recently done, and deal fully with the chemical changes met with in disorders of these organs.

The author foreshadows, in dealing with the pancreas, the importance of the research work at present being done on the secretion of the pancreas, as likely to be of service in the explanation of disease. From the papers already published in the medical journals this new line of investigation is of the greatest importance and likely to bear fruit in the near future.

The last chapter is on the changes of the nervous system found in disease. He traces the changes which the nerve-cell and nerve-fibres undergo in degeneration. Stress is laid on the importance of the injury that may be done to a nerve-cell by affections of its axis cylinder,

i.e., a reaction backwards on the cell itself as shown by the chromatolysis and displacement of the nucleus towards the periphery of the cell.

The book is thoroughly sound in every respect, and great care has evidently been taken to give as accurate account as possible of the processes of disease. We can heartily recommend it to students and others who desire to follow the study of scientific medicine.

The Bacteriology of Every-day Practice.—By J. ODERY SYMES, M.D. (State Medicine), Lond., D.P.H. London: Baillière, Tindall and Cox, 1904. *Medical Monograph Series.*

THIS little volume is the first of the Medical Monograph Series to reach a second edition; the present edition including sections on the staining of blood films, and on trypansomiasis as well as additions on matters more strictly bacteriological. There are to be found full descriptions for the preparing and staining of films, and the inoculation of culture media to the extent required by the general practitioner; and a consideration of the identification of bacterial diseases with clear indications as to when he is likely to be able to identify their cause personally, and when it will be advisable to send material to a laboratory for further investigation. A chapter on serum therapeutics, though only seven pages long, is a model of clearness and condensation. The book ends with an appendix on the microscope.

Since the author has already allowed himself to deal with subjects not strictly bacterial in his sections on malaria and trypanosomiasis, we would suggest the advisability of considering the addition of a section on differential blood counts if, as is likely, the demand for the book entails the publication of a third edition.

A Practical Guide to the Administration of the "Nauheim" Treatment of Chronic Diseases of the Heart in England.—By LESLIE THORNE THORNE, M.D., B.S. (Durham), M.R.C.S. (Eng.), L.R.C.P. (Lond). London: Baillière, Tindall and Cox, 1904.

THIS small book is written with the desire to describe the Nauheim treatment in such detail that those without any previous practical knowledge of it may be able to avail themselves of it by carefully following the instructions. The first chapter gives an exhaustive description of the method of giving one of the special baths, the result of which is to produce general capillary dilatation with lessening of the peripheral resistance, and diminution of the work of the heart. The second chapter describes the effect of the "Schott" exercises when properly carried out. Diagrams illustrating the various movements are deliberately omitted, since the author does not consider that the exercises can be properly learnt from them. This we do not consider to be correct, and their omission is a serious drawback to the popularisation of the treatment in this country. The third chapter describes the classes of cases suitable for the treatment, and the last gives examples of cases which have been benefited by it after other methods have failed. The histories of these are convincing, but the diagrams of diminishing cardiac dulness, which accompany them, are inconclusive, for some of them can hardly be explained except by supposing that the deep cardiac dulness is shown at the beginning and the superficial at the end. The book nevertheless is well worth reading.

Current Literature.

1.

PATHOLOGY AND BACTERIOLOGY.

The Differential Diagnosis of Typhoid Fever in its Earliest Stages—By W. C. Rucker (*American Journal of Medical Sciences*), January, 1904.—This paper was awarded the second prize by the Enno Sander Prize Medal Board of Award, and gives a good resumé of recent work bearing on the subject. He takes as a limit the first week of the fever, during which time the serum test is seldom of positive value. Spots may be seen as early as the first day, while Gibbes has shown that by photographic methods two or three days earlier. The early reduction in the number of white corpuscles, contrasting with the leucocytosis of pneumonia, etc., may also be of use. Wolff's method of cultivating from the stools of the case in broth, and after twelve hours testing the culture with a serum of an advanced typhoid case, when some of the bacilli will clump if the typhoid organism is present, is said to be of great diagnostic value in the early diagnosis. The method of making cultures from the blood obtained from a vein in the arm is next described, and by this method 87·5 per cent. of cases have been diagnosed within the first week of the disease, while it has proved successful as early as the second day. Five c. c. of blood placed in five flasks of 100 c.c. each are required for this method, the blood being obtained aseptically. It may also be obtained by spleen puncture, but the organ is not usually sufficiently enlarged in the early stages to make this a very easy and safe procedure. Several methods of isolating typhoid bacilli from the fæces are described, that of his being preferred. Plates are first made with an agar gelatine medium of an acidity of 1·8 per cent. normal hydrochloric acid, (in which typhoid colonies form small light greenish colonies with irregular outgrowths and fringing threads), and to these are added fæces mixed with broth until it is fairly cloudy. After eighteen to twenty-four hours the fringed colonies are inoculated into a tube of semi-solid agar gelatine of an acidity of 1·5 per cent. and incubated at 137 for eighteen hours. If the colonies are typhoid, this medium will become uniformly clouded in a characteristic manner, and they may be further tested with a typhoid serum if any doubt remains. The remainder of the article is mainly of a clinical character, but the differences in the blood changes in typhoid and malarial remittent fevers respectively are quoted from an Indian writer. Paratyphoid is also briefly discussed, the diagnosis from true typhoid being only possible by isolating the organism from the blood, or getting a serum reaction with one of the paratyphoid organisms, and a negative result with a typhoid one.

Paratyphoid.—The following definition of this fever is given in the *Journal of the American Medical Association*, January 1904: "The symptoms of paratyphoid fever are practically indistinguishable from those of typhoid fever. Usually the course is similar to that of a

rather mild typhoid, and the mortality seems to be low. Bowel disturbance is usually less marked, but may be present, and hæmorrhages occasionally occur. Rose spots, enlarged spleen and dicrotic pulse are present to about the same extent as in typhoid. The diagnosis is to be made by the failure of Widal in dilutions above 1-20, which is suggestive, and the isolation of the paratyphoid organism bacillus from the blood, which is the only positive method. In the few recorded autopsies the disease differs from typhoid in the absence of swelling of the Payer's patches and lymphatic apparatus of the intestine, although in a few superficial intestinal ulcerations have been found, the anatomic picture is rather that of non-specific septicæmia."

Report of the French Yellow Fever Commission.—The last quoted journal also gives a summary of this report, which confirms the previous work of Reed and his colleagues as to the disease only being conveyed by the bites of the mosquito called the Stegomyia fasciata, which must have first bitten a yellow fever patient during one of the first three days of his illness, and after at least twelve days inoculated the patient. The serum of an infected patient is virulent if injected into a susceptible person, but it is destroyed by being heated to 55 C for five minutes, and is kept back by a B Chamberlain filter, but passes through an F., being thus one of the "invisible organisms." The heated serum produces a relative immunity, which becomes complete on an additional injection of a small quantity of virulent serum.

Record of Parasitic Infections in the Phillipines.—By W. J. Calvert, *Boston Medical and Surgical Journal*, Oct. 28th, 1903. In this paper the number of intestinal parasites in 136 *post-mortems* at Manilla are analysed. Intestinal parasites were found in 39 per cent., or 53 cases, of which 29 showed ascaris lumbricoides, 10 anchylostoma duodenalis, 13 tricocephalus dispar, and 1 tænia solium. In 40 of them a single infection only was present. Adult males suffered most frequently, and female children least so. All the ankylostoma infections were light, the greatest number of worms found being 18, only 7·3 per cent. of the cases being infected with this parasite. These figures show that the parasites are much less common in the Phillipine Islands than in most parts of India.

L. R.

II.

DISEASES OF WOMEN.

Primary Carcinoma of the Fallopian Tubes.—M. Græfe (*Centralbl. f. Gyn.*, Dec. 20, p. 1,389).—Since Orthmann in 1888 demonstrated the occurrence of primary carcinoma of the Fallopian tubes, more than 50 cases have been published. But in comparison with carcinoma of the uterus or ovaries it is rare.

A married nullipara, aged 50, consulted the writer on September 19th, 1899. For nine months previously menstruation had occurred regularly every three weeks. The loss was profuse and lasted nine days. During the last six weeks there had been a constant blood-stained watery discharge. There were headache, attacks of vertigo, increased frequency of micturition, general malaise and anæmia. The uterus was extremely retroflexed and somewhat enlarged. Behind and below and in part distending the posterior vaginal fornix was a sausage-shaped, tense, elastic tumour, of the size of a fist. From the external os there hung a small mucous polypus, which was removed by torsion. The diagnosis rested between hydro-or pyo-salpinx and tubal carcinoma, the latter being suggested by the prolonged blood-stained discharge. Laparotomy was advised but declined. Hydrastis was given, the discharge ceased, and the menses became regular and of normal duration. Ten weeks later the tubal tumour was slightly larger. But four months later there was no change, and the general health was good. She was not seen again until February 4, 1902, when there had been a yellow vaginal discharge for three months, and a week before violent abdominal pain and obstinate constipation. Per vaginam the tubal tumour appeared to be unaltered, and the uterus was found to be smaller. But there was a slightly movable nodular tumour of the size of a fœtal head to the right of the uterus.

On February 15th, 1902, laparotomy was performed. On the right side there was an intraligamentous ovarian cystoma. This was shelled out. On the left side the dilated Fallopian tube was removed, after division of some adhesions. Its walls were tense, elastic, and translucent, so that the swelling exactly resembled a hydro-salpinx. Recovery followed, and eight months after the operation the general health was excellent.

The suspicion that the tubal tumour was a carcinoma had been abandoned, owing to the lapse of 2½ years without further development But when the sac was incised and the clear, serous contents had escaped, a papillomatous tumour of the size of a chestnut was found growing from the thin wall of the ampullary portion of the tube. This growth was of papillomatous structure, but the epithelium in places was stratified. Near the base was a number of alveoli, apparently composed of cancer cells. These were formed by the fusion of several papillæ and were not of true cancerous structure. The malignant nature of the growth was proved by (1) the epithelium covering the papillæ being in places stratified, and (2) the wall of the Fallopian tube near the centre of the base of the tumour having been invaded by long epithelial columns, which, however, did not extend to the peritoneum. The case shows that papillomatous carcinomata of the tubes may for a long time be practically benign, as the growth undoubtedly existed 2½ years before the operation, and the patient finally consented to an operation not for the carcinoma but for a simple ovarian cystoma. The arrest of the blood-stained discharge probably depended on complete closure of the uterine end of the Fallopian tube.—*Medical Review.*

Treatment of Pelvic Hæmatocele.—Schenk (Munchen med. Wchnschr., 1903, No. 16) discusses the relative advantages of operative *versus* conservative treatment. He quotes Prochownick's series of fifty-two cases treated successfully by conservatism, complete absorption taking place in from six to eight weeks. Prochownick believes, however, that better permanent results may be obtained by operation. Lindenthal formulates the rule that conservatism is the best line to adopt in all cases where urgent symptoms are absent. The treatment must be continued for one to two weeks; operation being resorted to when the tumour shows no signs of decreasing, or if fever or signs of suppuration intervene. Thorn, who is a strong advocate of conservatism, finds that patients so treated are able to resume work sooner than after operative treatment. Schenk's own experience is based on fifty-eight cases of ectopic gestation, thirty-two being treated by operation, twenty-six by conservative means, with almost equally good results in both. He advises operation in unruptured cases, and in hæmatocele, associated with continuous uterine hæmorrhage. In uncomplicated cases he thinks no operation is necessary.—*Edinburgh Medical Journal*, September.

Fracture of Clavicle in Cranial Presentations.—Muns (*Centralbl. f. Gynak., Leipzig*, 1903, No. 23) refers to Reither's series of sixty-five collected cases. Muns found twenty-two cases in 1,700 children delivered in the Copenhagen Maternity. Of the mothers, nine were primiparæ, thirteen multiparæ. The left clavicle was fractured in eight cases, the right in fourteen. Of the children, fifteen were males, seven females. Of the twenty-two cases, seventeen were spontaneous deliveries, the remainder being forceps cases. The middle third of the clavicle was most frequently affected. On account of the absence of any apparent impaired movement of the arm, the condition may be overlooked, as excessive abduction appears to be

the only affected movement. Crepitation is usually made out and well-marked callus is formed in from one to two weeks. Muns discusses the probable causation of this injury, and believes that pressure of the anterior shoulder against the symphysis pubis is the most important factor.—[*Edinburgh Medical Journal*, September.]

Immediately Delivery in Eclampsia.—Bumm (*Munchen. med. Wchnschr.*, 1903, *No.* 21) records his experience of the treatment of eclampsia based on 112 cases. He refers to the narcotic treatment for checking the severity of the fits, and reports forty-seven cases so treated as follows:—

12	by chloroform	4	deaths
31	„ morphia	9	„
4	„ chloral and morphia	2	„
47		15	—mortality 30 per cent.

Of those cases delivery was terminated as follows:—Version, seven cases; forceps, eighteen cases; craniotomy, two cases; undelivered, two cases. Against the chloroform method Bumm points out the disadvantage of the necessity of frequent repetition, and the delay in getting the patient anæsthetised. He has not been able to corroborate the excellent results obtained by Vert and Stroganoff from the morphia and chloral method. He believes this treatment tends to deepen the coma and to produce cardiac paralysis.

Of forty-three cases treated by venesection and transfusion, thirteen, or 30 per cent, died.

Since April 1901, Bumm has treated all cases (irrespective of the stage of labour) by rapid delivery, which has generally been accomplished within half an hour. Of twenty-five cases so treated, delivery was carried out as follows:—

Cæsarean section	1 case.
Vaginal Cæsarean section	7 cases.
Forceps	7 „
Version	6 „
Extraction	1 case.
Perforation (dead child)	1 „
Spontaneous delivery	2 cases.
	25

Of the total three, or 12 per cent., died, excluding one where death resulted later from pneumonia, two deaths or 8 per cent. Bumm concludes that cases of eclampsia even in the earliest stages of labour, or before its onset, are best treated by this method. He discusses the relative advantages of different methods of delivery. He favours vaginal Cæsarean section, which permits of delivery in from ten to fifteen minutes. He reports fourteen cases, so treated, with one death.—[*Edinburgh Medical Journal*, September.]

Acute Puerperel Bronchocele.—Malade (*Berlin. Klin. Woch.*, May 4th, p. 412). A slight enlargement of the thyroid gland usually occurs during pregnancy, but causes no discomfort. It is due to simple hyperæmia. As a rule, the swellings subsides after delivery, but it is occasionally succeeded by hypertrophy. Distinct from this is the form of bronchocele which arises acutely during parturition—the *goitre puerperal* of the French. It may attain a great size with remarkable rapidity and produce alarming circulatory and respiratory symptoms. The swelling develops during the pains and is of mechanical origin. A similar condition may occur acutely in males during violent and prolonged exertion. The goitre may completely disappear *post partum*, but frequently persists. Professor Martin, of Griefswald, states that in four or five cases he has seen a previously unnoticeable thyroid gland expand to the size of a clenched fist during severe labour. The writer has seen three cases of acute puerperal goitre during the last two years.

Case 1.—A woman, aged 48, had no thyroid enlargement until her first confinement, which occurred fifteen years before she was seen by Malade. Immediately after the child was born she noticed a slight goitre which disappeared in some months. It recurred and again disappeared after the second and third confinements. During the fourth labour a considerable goitre suddenly appeared. The fifth, sixth, and seventh children were born without any thyroid changes. During the eighth labour, five years previously, the thyroid gland enlarged considerably. The goitre had since persisted. It was hard and nodular and consisted of the enlarged middle and right lobes of the gland, each of which was the size of a man's fist.

Case 2.—A woman, aged 39, had her first child at 25. During a pain a nodule appeared in the neck. During the puerperium, it slowly subsided. In the following eight labours, a considerable swelling appeared, attained its maximum size before delivery, and then became smaller. During the last labour, six months before Malade saw her, the goitre attained its greatest development and had since scarcely diminished. The tumour was of the size of a child's fist, hard, and slightly nodular, and involved the right lobe of the gland.

Case 3.—A woman, nearly 30, had had her first child two years previously. When seen by Malade she was at the end of her second pregnancy. There had been three or four severe hæmorrhages during the last two months.

Inspection revealed no goitre. A placenta prævia centralis was diagnosed. The vagina was plugged, and she was removed to hospital. The following day there was renewed hæmorrhage, the os was artificially dilated, the placenta was perforated, and version performed. As there was but slight hæmorrahage, natural delivery was awaited. Twenty minutes later, before pains had appeared, she died suddenly.

Necropsy.—There were no changes sufficiently marked to account for death with certainty. The general anæmia was moderate, but there was extreme anæmia of the brain. This, which was the probable cause of death, appeared to be due to compression of both carotids by a fairly large bronchocele. It had probably increased in size during labour.—[*Medical Review* September.]

J. W. F. R.

Correspondence.

A PAY GRIEVANCE.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—The special correspondent of the *British Medical Gazette* for India, in the issue of that paper for April 9th last refers to the great difference between the pay of an I. M. S. officer gazetted to the permanent charge of a Native Regiment before entering the Civil Department, and that of his less fortunate brother officer who may have entered the civil branch before obtaining the full pay of the regiment. I think it is time to warn junior officers in military employ that this cherished belief has been of late treated with scorn by the Accountant-General of Bengal, who flourishes Art. 96 of the Civil Service Regulations in the face of those who claim half the staff pay of their Regimental appointments, and maintains that an officer "cannot draw more than the maximum pay of his appointment."

Can you or your readers quote the regulation upon which the general belief is founded, that, as long as a medical officer retains a lien upon his regiment, he is entitled to half the staff pay? Such a regulation must exist somewhere, or the idea would not be so prevalent. As matters stand at present, the junior officer who just does the minimum of regimental duty gains years in seniority over the man who remains five or six years with his regiment and loses nothing in pay.

The only instance in which the Accountant-General of Bengal will now pass claims for half the Regimental Staff Pay of a medical officer is when the latter officiates in one of the junior appointments in the Presidency hospitals.

Yours, &c.,
DELUDED.

NOTE ON THE DIAGNOSIS OF MALTA FEVER IN INDIA.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—In connection with the remarks made under the heading of "Malta Fever" on pp. 107 and 108 of the annual report of the Sanitary Commissioner with the Government of India, for 1902, it may be of some value to record the results obtained by testing the agglutinative properties of the blood

of certain healthy individuals in Madras, and of some patients suffering from long continued, but ill-defined, forms of fever in the General Hospital, Madras, during December 1902 and the early part of 1903.

The culture of micrococcus melitensis had been kindly supplied to me by Major Semple, R.A.M.C., from Kasauli.

TABLE 1.

HEALTHY PERSONS.

Race.	Age.	Reaction. 1 in 20.	Reaction. 1 in 100.
Hindu ...	45	60 mins. partial ..	60 mins. *nil*.
,, ..	33	60 ,, *nil* ...	.....
,, ...	23	30 ,, partial ...	60 mins. *nil*.
,, ...	28	30 ,, ,, ...	30 ,, partial.
,, ...	53	30 ,, ,, ...	60 ,, ,,
,, ...	22	60 ,, ,, ...	60 ,, *nil*.
European	32	60 ,, *nil* ...	.....
,, ...	30	60 ,, ,, ...	.....
,, ...	40	60 ,, ,, ...	.....

TABLE 2.

PATIENTS IN HOSPITAL.

Race.	Age.	Reaction. 1 in 20.	1 in 80.	1 in 200.	1 in 400.
European ...	22	5 mins. complete ..	60 mins. complete ...	60 mins. partial ...	60 mins. partial.
,, ...	17	5 ,, ,, ...	20 ,, ,, ...	60 ,, ,, ...	60 ,, ,,
,, .	22	60 ,, partial ...	60 ,, *nil* ...	....	.....
Eurasian ...	30	30 ,, ,, ...	30 ,, ,, ...	....	.....
,, ...	45	30 ,, complete ...	60 ,, partial ...	60 mins. partial ...	60 mins. partial.
,, ...	35	30 ,, partial ...	30 ,, *nil* ...	....	.....
Hindu ...	34	15 ,, complete ...	45 ,, complete ...	60 mins. *nil* ...	.....
,, ...	35	60 ,, partial ...	60 ,, *nil* ...	....	.....
,, ...	7	60 ,, ,, ...	60 ,, ,, ...	....	.....

All the patients in Table 2 were suffering from long continued fever, the nature of which had not been cleared up at the time of the examination of the blood, but none of them at any time presented symptoms which made it at all likely that Malta fever was the disease. It is obvious, therefore, that even with dilutions of 1 in 80 a complete agglutination of micrococcus melitensis is not pathgnomonic of Malta fever, and that the blood of persons suffering from various febrile conditions may have a higher agglutinative power on the micrococcus than that of persons in good health.

Yours, &c.,

(Sd.) J. CORNWALL, M.A., M.B. (CANTAB.),
Capt., I. M. S.,
Profsr. of Hygiene & Practl. Bacteriology,
May 1904. *Madras Medical College.*

"A QUESTION OF PRIORITY."

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR—In the May issue of *The Indian Medical Gazette* Major Donovan points out that "there is no similarity whatsoever between Piroplasma donovani and the bodies found by Cunningham." I am at a loss to know upon what grounds Major Donovan makes this statement. Anyone who has read Surgeon-Major Cunningham's original paper will, I think, admit that he was the first to observe the Delhi sore parasites recently described by Dr. Wright of Boston. Admitting this, the whole discussion rests upon the answer to the following question: Are the parasites of Delhi sore similar to the so-called Leishman-Donovan bodies? If this question is answered in the affirmative, we must agree with the Editor of the *Scientific Memoirs* in regarding Surgeon-Major Cunningham as having been the first to observe parasites of this nature. The question cannot, however, be answered by mere assertion, as Major Donovan seems to think, but—as you pointed out in your editorial in the April number—by careful study. I am informed that Delhi sores do not occur in Madras, and for this reason I do not think I am wrong in conjecturing that at the time his letter was written, Major Donovan had not seen the very characteristic parasites which are present in the tissues of some specimens of those sores. The morphology of the so-called Leishman-Donovan bodies has been worked out by Dr. Christophers, and from an examination of the specimens of Delhi sore which I have obtained, I am able to state that *morphologically* the parasites of Delhi sore are indistinguishable from the parasites found in enlarged spleen cases. This is the extent of our knowledge upon the subject at present, but it is, I think, sufficient to confirm the correctness of the opinion expressed by the Editor of the *Scientific Memoirs* that "similar bodies" were observed by Surgeon-Major Cunningham in 1885.

S. P. JAMES.
May 12th, 1904. *Captain, I. M. S.*

PIROPLASMA OR PYROPLASMA.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR.—In the footnote to Lingard and Jenning's startling article on "A Preliminary Note on Pyroplasmosis in Man, &c.," in last May's number, you state that "the spelling of the word, piroplasma or pyroplasma, is uncertain and should be agreed upon."

I regret my inability to solve the enigma of the complicated and most unusual developmental history of the Pyroplasma (*sic*) described therein and shall leave this task to some Œdipus to essay; I merely submit a short note on the spelling of the word called in question.

There is no uncertainty about the spelling; it is Piroplasma from the Latin *pirum*, a pear, and plasma. Piroplasma also possesses the right of priority; no recognised authority, prior to 1895 (*vide ultra*) has spelt the word with a "y."

In 1893, Smith and Kilborne gave the name Pyrosoma (Latin *pyrum* or *pirum*, a pear, and the Greek σῶμα) to the parasite of Texas Fever, but a similar word though with a different meaning had already, in 1804, been very appropriately given by Péron to a phosphorescent ascidian (Greek Πῦρ fire and σῶμα).

In 1895, the word Apiosoma (Greek ἀπιος a pear, and σῶμα) was substituted by Wandolleck, but this generic term too, had been already appropriated by Blanchard in 1885.

The only word left for adoption, and free from any objection, is Piroplasma given in 1895 (*non* 1885 *apud Labbé*?) by Patton to the hæmosporidian under discussion.

MADRAS, *12th May* 1904. } Yours, &c.,
C. DONOVAN, *Major, I.M.S.*

Service Notes.

THE death on March 19th of Deputy Surgeon-General Henry Cayley, L.M.S., retired, removes another of the retired veterans of the Indian Medical Service. Henry Cayley's name became so well-known within recent years on account of the good work he did in South Africa that perhaps many readers are not prepared to hear that he died in the 70th year of his age. He was born in 1834, was educated medically at King's College Hospital, and got his M.R.C.S. in 1855 at the age of 21. He entered the I.M.S. on 27th January 1857, became Surgeon in 1869, Surgeon-Major, 1873, Brigade-Surgeon, 19th April 1884, and got the rank of Deputy Surgeon-General on retirement.

He was first of his batch by competition, and served during the Mutiny in Benares, Allahabad, and Gorrackpore Districts. He was Civil Surgeon of Gorrackpore, Simla, Burdwan and Howrah, and was Resident at Ladak from 1867 to 1871, then Civil Surgeon of 24-Pergunnas, and afterwards Ophthalmic Surgeon in Calcutta.

He became an F.R.C.S. (Eng.) in 1886, and on 29th April 1887 he retired from the service. Soon after he became a mem-

ber of the Medical Board of the India Office, and on the sudden death of Boyes Smith he was appointed Professor of Military Medicine at Netley (1889—1897). More recently he went to South Africa (at the age of 65) as Senior Officer of the Scottish National Red Cross Hospital, where he was mentioned in despatches and received the order of C. M. G. He was also recently appointed Honorary Surgeon to the King. One of his sons is one of the Health Officers in Bombay, and one of his daughters married Lieutenant-Colonel H. R. Whitehead, R.A.M.C.

COLONEL C. W. CARR-CALTHROP, I.M.S., M.D., has retired from the service. He entered on April 18th, 1869, served in the Afghan War of 1878-79 (medal with clasp), he was for some time Medical Storekeeper to Government in the Punjab, and was P. M. O. at Suakin during the Donzola Expedition of 1896. In the past few years he was Sanitary Commissioner with the Government of Assam and went home on leave a few months ago.

LIEUTENANT-COLONEL. E. FERRAND, M.D., I.M.S. (Madras), died recently in Peshawar. He had served with the Burma Expedition of 1886-87, and in the Samana and Kurram Valley, relief of Gulistan, and Tirah in 1897-98.

He entered the service as surgeon in September 1875 and became Lieutenant-Colonel, 30th September 1895. He was in the 54th year of his age.

THE recent changes in the lists of the Bengal Civil Medical Department in the *Civil List* are good, *e.g.*, the list of first and second class Civil Surgeons, the list of the Staff of the Calcutta Hospitals, &c., but we cannot say we care about the printing of officers names, according to the more or less accidental date of their *confirmation* in the Civil Department. Majors, Lieutenant-Colonels and Captains are consequently mixed up in a way which makes it difficult to find any officer's name required.

WE extract the following notes on the medical arrangements of the Japanese and Russians from our United States contemporary (*Journal of Military Surgeons*, p. 263, April):—

"As Japan's principal territory consists of several large islands, of which only two—Kiu-Siu and Nippon—have railroads, she cannot rely on hospital trains as the chief means of evacuating her sick and wounded, and for a long time has planned to use hospital—or rather ambulance—ships. In the Chino-Japanese war she utilized transports: and as soon as the Treaty of Shimonoseki was signed the Japanese Red Cross Association resolved to have two ships specially constructed for ambulance and hospital service in time of war. As it would have been too expensive to reserve these ships exclusively for such service, it was arranged that the great Japanese steamship company "Nippon-Yusen-Kaisha" should buy them at cost price, paying for them in twenty annual instalments, use them ordinarily for its own purposes as passenger and freight steamers, and turn them over to the Red Cross at such times as the latter should consider it desirable to have them.

"These two ships, the *Hakuai-Maru* and the *Kosai-Maru*, were built on the Clyde. Both were constructed on the same plans. Each has a displacement of 2,700 tons, a draught of six metres, length 95 metres, beam 12 metres, and a speed of 15 knots an hour.

"In the upper deck are the saloon and cabins, a disinfecting room, laundry, galley, hoist, lamp-locker, bath-rooms and water closets. Three of the state-rooms on this deck are assigned to the Red Cross delegate and his secretary, two to officers of the Imperial Navy and interpreters, one to the chief medical officer, and others to the officers properly belonging to the ship.

"In the 'tween-decks are the state-rooms of the junior medical officers, of the pharmacists, and of the female nurses, and a mess-room for the latter. The hospital, which is situated in this part of the ship, is composed: aft, of several state-rooms, holding in conjunction 45 cots reserved for officers; further forward, of state-rooms and a large ward capable of holding 115 non-commissioned officers and soldiers; still further forward, and separated from the others by a bulkhead, is a ward of 42 cots for contagious cases. There are also on this deck operating rooms, dispensary, radiographic room, laboratory, bath-rooms, etc.

"The lower deck comprises the quarters of the hospital corps, a mortuary, an ice-plant, a refrigerating room, a baggage room, and store-rooms; further forward, machines for cooling and compressing the air, used in the artificial ventilation of the ship, and the boilers; and way forward, the quarters of the crew.

"The medical personnel embarked includes among others, a delegate from the Red Cross, a chief medical officer, three junior medical officers, a pharmacist and an assistant pharmacist, a secretary or chief clerk, achief of female nurses, two hospital sergeants-major, two female nurses (chiefs of squad), two hospital sergeants, nine female nurses, twenty-eight hospital corps soldiers, an instrument sharpener, a laundryman, interpreters, etc.

"The name *Hakuai-Maru* signifies "Boundless Love" or "Benevolence." This ship was on her way to Shanghai, when she received orders, on the 28th of June, 1900, at the beginning of the international intervention in China, to get ready for active war service. After being fitted out at Yokohama, she started for Taku on the 7th of July. Between the 7th of July and the end of April she made seven trips from China to Japan, transporting in all 1,538 patients, of whom 1,420 were disembarked at Ujina and 21 died on the way.

"The name *Kosai-Maru* means "Eternal Charity" or "Beneficence." This ship likewise made seven trips from China to Japan between the 28th of July and the 18th of November, 1900, and transported 1,328 sick to Ujina.

"These ships carried to Japanese military hospitals patients not only from the Japanese forces, but also some from others of the allied forces—123 of the French, for example."

THE NAVAL HOSPITAL SHIP, *KOBE-MARU.*

IN the Chino-Japanese War of 1894, the *Kobe-Maru*, a Japanese mail steamer, was adapted to hospital purposes and contributed most effectively to the service of the sick and wounded. It was provided with wards for surgical, medical, infectious and insane cases, a disinfection room, an operating theatre, a laboratory and other necessary quarters. The medical staff consisted of three surgeons, three surgeon probationers a pharmacist and nine sick-berth attendants and assistants. The ship had a capacity of two hundred patients, although on account of the fine transport service which existed, her full capacity was never taxed—not more than fifty patients ever being carried at one time. The total number of patients received, during the war, August 1894-August 1895, was 696, of whom 90 were wounded in action, one a Chinese captive, and 605 were sick and wounded otherwise than in action.

RUSSIAN MILITARY MEDICAL AFFAIRS.

"THE question of hospital ships, so important to the Japanese, is of but little consequence to the Russians, whose fleet is blockaded. If it should become active, however, it is probable that the powerful and patriotic Red Cross would come to its aid as in the war with China.

At that time it took a freight steamer with a tonnage of about 3,000, and transformed it into a hospital, under the name of *Czaritza*.

On the upper deck were the quarters of the medical corps and some rooms for sick officers. In the 'tween decks were two large saloons serving for the hospital; the beds were large and moveable; in the centre of each ward was a dining table and connected with them were bath-rooms and lavatories; the surgical ward also contained every thing necesary for wound dressing.

The operating room was located in the 'tween decks and was provided with two operating tables, a sterilizer and an instrument case; it was lighted during the day by skylight and at night by electricity.

The dispensary although small, contained numerous medicines and every thing necessary for chemical and bacteriological examination.

The ship could accommodate 156 patients; it was lighted by electricity, heated by steam, and the drinking water was distilled on board.

The medical personnel consisted of three civilian physicians, and a military pharmacist, having under orders eight male and six female nurses.

What the Russian Red Cross did in 1900—1901 is nothing in comparison with the enthusiasm that prevails to-day. Gold pours into its treasury from all directions, both for the treatment of the wounded and sick and for the care of the families of the disabled.

The milititary Red Cross has now mobilized twenty-six field hospitals with 5,050 beds.

A sanitary railway train left recently for the scene of hostilities. It comprised eight cars for the sick, of which four were reserved for the severely injured and four for the more slightly wounded. There was also a cook's car, a medicine car, an operating car, two cars for linen and clothing, and a car for wounded officers.

Numerous other Red Cross trains have left St. Petersburg for the Far East. The ladies of the Red Cross, the "sisters of charity" as they are called in Russia, have freely entered upon their mission of devotion and abnegation. They come from all classes of society; they are both old women and young girls: and are attired in the classical nursing uniform, with the white cap and the shoulder cape.

It is more than probable then that the Russian Red Cross will take a prominent part in the sanitary service in Manchuria and assume a position of much greater importance than is allowed to it by the regulations of other European armies.

The medical department of the Russian Army has long been embarrassed by its peculiar and awkward organization. Medical officers have had no military rank, but have been rated as civilians with relative official—not military—

rank among themselves. The medical inspector-general, who is the head of the medical department, is the chief of the ninth division of the ministry of war and has in his charge the direction of the medical personnel and material. The administrative feature is, however, in charge of a Hospital Commission attached to the second division of the ministry and composed of officers of three other departments in addition to the medical inspector-general. This distinct separation of the "sanitary direction" and "hospital inspectorship" continues down through the entire medical work and has proven obstructive in a high degree. It has been proposed to correct these evils by (1) uniting the disjointed functions into a single department, and (2) by conferring military rank upon medical officers, propositions which appear to have the approval of General Kuropatkin and which, it is hoped, he officially acted upon before his departure for the Orient."—*La Caducée.*

MAJOR W. H. E. WOODWRIGHT, I.M.S., F.R.C.S.I., has been granted combined leave for a total period of nineteen months, from 13th April 1904.

HONORARY CAPTAIN MURPHY, I.S.M.D., was granted two months' leave, from 15th May.

CAPTAIN HUTCHESON, I.M.S., is posted to Aligarh as Civil Surgeon.

MAJOR J. C. LAMONT, M.B. (Edin.), I.M.S., is appointed to officiate as Principal of the Lahore Medical College, during the absence on leave of Lieutenant-Colonel F. F. Perry, I.M.S.

CAPTAIN E. VICTOR HUGO, M.B. (Lond.), I.M.S., is appointed to act as Professor of Surgery in Lahore Medical College.

MAJOR D. T. LANE, I.M.S., is appointed Civil Surgeon of Dharmsa'a.

CAPTAIN W. C. H. FORSTER, I.M.S., is appointed Deputy Sanitary Commissioner, Punjab, *vice* Captain W. F. Harvey, I.M.S.

CAPTAIN M. BARRY, I.M.S., is appointed Civil Surgeon of Murree.

CAPTAIN G. M. I. C. SMITH, I.M.S., is appointed Civil Surgeon of Dalhousie.

MAJOR C. DUER, I.M.S., F.R.C.S., acts as Civil Surgeon, Rangoon, *vice* Lieutenant-Colonel Davis, I.M.S., and Captain F. A. L. Hammond, I.M.S., is appointed Junior Civil Surgeon, Rangoon.

THE next (13th) annual meeting of the Association of Military Surgeons of the Army of the United States will take the form of an International Congress of Military Surgeons. It will be held at the WORLD'S FAIR in St. Louis in October, 10th to 15th, 1904.

We hope it will be possible to depute a medical officer to represent the Medical Department of the Indian Army.

THE Seaman Prize of an hundred dollars in gold open to all officers of the American Army is offered on the following subject:—

Military Hygiene: how best to enforce its study in our military and naval schools, and promote its intelligent practice in our army.

THE Journal of the R. A. M. C. for April gives a description with plans of the new Royal Army Medical College in Grosvenor Road, London. The new college is admirably adapted for the purpose intended, and must tend to attract all medical officers in or near London for the purpose of scientific and social intercourse.

MAJOR J. JACKSON, I.M.S., has been again appointed to act as Inspector-General of Prisons, Bombay, *vice* Mr. H. N. Alexander, granted leave for 22 months.

CAPTAIN G. C. LAING, M.B., I.M.S., is appointed to act as Superintendent, Central Prison, Yerroada, and Captain C. S. Lowson, I.M.S., as Superintendent, Central Prison, Ahmedabad.

THE services of Captain G. King, M.B., I.M.S., and of Captain J. J. Urwin, M.B., I.M.S., are placed at the disposal of the Bengal Government.

THE services of Captain J. J. Robb, M.B., I.M.S., and of Lieutenant S. Bose, I.M.S., are placed at the disposal of the Madras Government.

THE services of Lieutenant G. Fowler, I.M.S., are placed at the disposal of the Government of the Central Provinces.

LIEUTENANT-COLONEL F. F. MACCARTIE, C.I.E., I.M.S., was appointed to act temporarily as Mint Master in addition to his duties as Assay Master, Calcutta.

CAPTAIN A. W. R. COCHRANE, I.M.S., F.R.C.S., reported his departure on furlough on 24th March 1904. Captain Cochrane was confirmed in the Civil Medical Department, Bengal, on 5th December 1900.

DR. P. A. RIGBY is appointed Civil Surgeon of Monghyr, during the absence on leave of Major F. A. Rogers, I.M.S. D.S.O.

MAJOR E. HAROLD BROWN, M.D., M.R.C.P., I.M.S., is appointed a Civil Surgeon of the first class with effect from 25th January 1904.

MAJOR A. H. NOTT, M.B., I.M.S., Civil Surgeon of Murshidabad, is appointed a Civil Surgeon of the first class from 2nd April, during absence of Colonel R. Macrae, I.M.S.

MILITARY ASST.-SURGN. JOHN HARDAKER, I.S.M.D., is appointed to the medical charge of the Remount Depôt, Mona.

CAPTAIN R. MCCARRISON, I.M.S., assumed medical charge of Chitral on 1st April 1904, relieving Lieutenant F. E. Wilson, I.M.S.

CAPTAIN W. E. MCKECHNIE, I.M.S., is granted three months' leave out of India.

CAPTAIN R. MCL. DALZIELL, M.B., I.M.S., is appointed temporarily to the Jail Department, Bengal, and posted as Superintendent, Presidency Jail, Calcutta, *vice* Captain Mulvany, I.M.S., granted one year's leave.

SIX weeks' special leave has been granted from 20th April to Lieutenant-Colonel E. W. Reilly, I.M.S., Civil Surgeon, Akola.

PRIVILEGE leave for two months and sixteen days is granted to Captain W. H. Kenrick, I.M.S., Civil Surgeon of Wardha, C. P.

LIEUTENANT-COLONEL T. R. Macdonald, M.B., I.M.S. (retd)., who was for many years a well-known Civil Surgeon in Bengal, has resigned his commission as Surgeon Lieutenant-Colonel in the Volunteer Battalion of the Queen's Own Cameron Highlanders.

ON his return to Edinburgh University, after having been some 18 years Professor of Anatomy in the School of Physic of the University of Dublin, Professor D. J. Cunningham has been made Fellow (*Hon. causâ*) of the Royal College of Surgeons, Edinburgh. Dr. Cunningham is one of the examiners for the entrance examination to the army medical services, and served upon the S. A. Hospital Commission.

LIEUTENANT H. E. SMITH, I.M.S., has passed the Lower Standard in Urdu.

LIEUTENANT-COLONEL A. M. DAVIES, R.A.M.C., was recently sent to Salisbury Plain to investigate an outbreak of enteric fever at the Bulford Camp. The out break is attributed to faulty water-closets in the officers, mess.

CAPTAIN A. T. GAGE, I.M.S., Curator, Royal Botanic Gardens, Calcutta, is allowed six months' combined leave from 27th April.

CAPTAIN T. HUNTER, I.M.S., is appointed to act as Civil Surgeon of Farrukhabad.

LIEUTENANT J. E. CLEMENTS, I.M.S., is appointed to officiate as Superintendent, Central Jail, Lucknow.

LIEUTENANT A. W. GREIG, I.M.S., is appointed to act as Superintendent, Central Prison, Fatehgarh.

MAJOR W. E. JENNINGS, I.M.S., on return from furlough, was appointed Health Officer, Port of Bombay. While at home Major Jennings took M.D. (Edin.) and the D.P.H.

LIEUTENANT-COLONEL MCCLOGRY, I.M.S., F.R.C.S.I., is granted six months' combined leave.

LIEUTENANT-COLONEL R. J. BAKER, M.D., I.M.S., is appointed Civil Surgeon of Karachi.

MAJOR B. B. GRAYFOOT, I.M.S., on return to duty, is appointed Civil Surgeon, Dharwar.

MAJOR J. B. SMITH, B.A., M.B., I.M.S., is to act as Civil Surgeon, Belgaum.

ARMY MEDICAL SERVICE IN THE FIFTEENTH CENTURY.—The following passages are taken from Church's monograph on Henry V, and refer to the preparations for the campaign which was signalised by the victory of Agincourt: "Now for the first time, at least in English history, we find a Commander-in-Chief making regular provision for the medical and surgical treatment of his sick and wounded. Early in the year (the indentures bear date April 29, 1415), the King had agreements drawn up with his physician, Nicholas Colnet, and his surgeon, Thomas Morstede. Each was to have the daily pay of twelve pence and to have a guard of three archers, each archer receiving the daily pay of sixpence." "We do not hear of Nicholas Colnet being furnished with any assistance. . . . . On the other hand, Thomas Morstede, the surgeon, was accompanied by a considerable establishment. [He] was . . . directed to take with him twelve of his own craft, each . . . to receive the daily pay of an archer. . . . . [His] request for a transport service, modestly limited to a chariot and two waggons, was granted."—(*Polyclinic*, April.)

LIEUTENANT C. A. SPRAWSON, I.M.S., is appointed to the officiating medical charge of the 18th Infantry.

ASSISTANT-SURGEON R. J. K. STONE has passed the Lower Standard examination in Pushtu.

LIEUTENANT-COLONEL G. J. KELLIE, I.M.S., officiates as P. M. O., Derajat District, *vice* Lieutenant-Colonel G. Duncan, I.M.S., deceased.

MILITARY ASSISTANT-SURGEON R. L. GLASS, I.S.M.D., is appointed to the Walker Hospital, Simla.

LIEUTENANT-COLONEL A. W. P. INMAN, R.A.M.C., is appointed officiating P. M. O., Oudh and Rohilkhand Districts.

REWARDS—GOOD CONDUCT AND MERITORIOUS SERVICE HOSPITAL ASSISTANTS.—The Government of India have been pleased to decide that, with effect from 1st April 1904, hospital assistants of the Indian Subordinate Medical Department, ranking as native warrant officers, shall be eligible for the meritorious service medal, with an annuity of Rs. 25 under precisely the same conditions as are applicable to duffadars and havildars of the native army under Articles 335, 337 and 349, Army Regulations, India, Volume I, Part II, except that the annuity will not be tenable in addition to pension, and will consequently terminate on discharge.

2. The above decision does not apply to civil hospital assistants, or to military hospital assistants seconded for civil employ.

3. The total number of medals and annuities will not at any time exceed twenty-one.

4. Recommendations for the grant of these meritorious service medals and annuities will not be required to be submitted to Army or Command Head-Quarters. The Principal Medical Officer, His Majesty's Forces in India, will divide the twenty-one medals and annuities among the three establishments (Bengal, Madras and Bombay) of the Indian Subordinate Medical Department, in proportion to their respective cadres, and will himself select the hospital assistants to be rewarded, on the first grant as well as on the occurrence of vacancies hereafter. The awards will be notified in India Army Orders.

IT is notified that all medical officers of Guards Regiments must decide within six months whether they will remain with the Guards or be transferred to the Royal Army Medical Corps.

A CAMP of Instruction for R.A.M.C. is to be formed on Salisbury Plain during July and August.

THE tenure of appointment of Colonel D. Wilkie will reckon from 2nd April 1904.

HONORARY CAPTAIN THOMAS DAVIS, I.S.M.D., and Honorary Lieutenant A. L. Senior, I.S.M.D., are permitted to retire from the service.

MAJOR A. W. ALCOCK, I.M.S., F.R.S., is appointed President of the Committee of the Calcutta Zoological Gardens.

CAPTAIN R. STEEN, I.M.S., Regimental Medical Officer, Dinapore, is appointed to the medical charge of the Civil Station of Dimapore, in addition to his other duties.

LIEUTENANT-COLONEL K. S. NARIMAN, I.M.S., is allowed six weeks' leave from date of relief.

ASSISTANT-SURGEON P. A. CORDEIRO, I.M.S., acts as Civil Surgeon of Nasik, during the absence of Lieutenant-Colonel Nariman, I.M.S.

MR. V. N. CHITALE, F.R.C.S. (Eng.), is appointed Honorary Surgeon to the J. J. Hospital, Bombay.

MR. W. M. HAFFKINE, C.I.E., Director-in-Chief, Plague Research Laboratory, was granted two years' combined leave from 30th April 1904.

MAJOR B. B. GRAYFOOT, I.M.S., was appointed Civil Surgeon of Dharwar, relieving Major J. B. Smith, M.B., I.M.S.

THERAPEUTIC NOTES AND PREPARATIONS.

AN antiseptic has recently been placed on the market named **Pearson's Antiseptic**. It contains 17·7 of cresylic bodies, it forms a perfect emulsion with water. Its disinfecting power is said to be so superior, according to W. J. Dibdin, F.C.S., to carbolic acid, that 25 per cent. more of carbolic is required to exert the same antiseptic power. Dr. Klein in his report on it states that a *one per cent.* emulsion of Pearson's Antiseptic is capable of disinfecting active b. coli in 2½ minutes, and a three per cent. emulsion reliably destroys the staphylococcus pyogenes in one minute.

It appears to be a reliable disinfectant for sick-rooms, hospitals, &c. The address of Pearson's Antiseptic Company is 254*a*, High Holborn, W. C., London.

The number of preparations of adrenal active principle is great, the latest and one of the best is F. Stearns & Co.'s **Adnephrin**, which is described as "a sterile and stable solution of the blood-pressure-raising principle of supra renal capsule."

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will **receive 25 Reprints gratis**, if requested.

Communications on Editorial Matters, **Articles, Letters and Books for Review** should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscriptions to the Indian Medical Gazette, Rs. 12, *including postage, in India. Rs.* 14, *including postage abroad.*

BOOKS, REPORTS, &c., RECEIVED.

The Report, 1902, of Sanitary Commissioner with Govt. of India.
Medical Laboratory Method and Tests by H. French (Ballière, Tindall & Cox).
Waddell's Edition of Lyon's Medical Jurisprudence. (Thacker, Spink & Co.).
International Journal of Surgery. (Oriental Edition).
The Antiseptic (first number). Calcutta.
The British Journal of Disease of Children, No. 1. (Adlard & Co., London).
Orthman's Handbook of Gynæcological Pathology. Roberts (J. Bale Sons and Danielson).
Asthma in relation to the Nose by A. Francis (Adlard & Sons).
Administration Report, Berars.
Central India Administration Report.

ACKNOWLEDGMENTS, COMMUNICATIONS RECEIVED.

Major E. Jennings, I.M.S., Bareilly; Major W. E. Jennings, I.M.S., Bombay; Major Donovan, Madras; Lieut. Davys, I.M.S., Thibet; Secretary, Ludiana Zenana Mission; Capt. Windsor, I.M.S., Agra; Major R. H. Elliot, Madras; Major Sutherland, I.M.S., Pachmari; Major Moir, I.M.S., Calcutta; Major Tull Walsh, I.M.S., Calcutta; Major Adie, I.M.S., Ferozepore; Capt. S. P. James, I.M.S., Simla; Capt. F. L. Hammond, I.M.S., Rangoon; Capt. E. R. Rost, I.M.S., Rangoon; Revd. Dr. Crozier, Tura, Assam; Hony. Secy., U. S. Club, Simla; Major H. S. Wood, I.M.S., Sylhet.

Original Articles.

SCURVY IN SOMALILAND.
NOTES ON THE CONDITION OF THE BLOOD SERUM.

BY J. FLEMING BARNARDO,
LIEUT., I.M.S.,
Somaliland Field Force.

THESE few observations were made with a view to determine the therapeutical value in this disease of certain food stuffs and drugs, and eliciting any information as to prophylaxis and treatment, that might be of use in future campaigns.

2. In view of the large morbidity among the Indian troops in this campaign from scurvy disease, it would appear that the dietary supplied them is deficient in certain important alimentary principles, and from the relatively large mortality, it would also appear that the necessary curative agents are not at hand for treatment. That this mortality and morbidity are excessively high may be seen from the following figures from July 1903 to March 31st, 1904:—

Admissions from all causes.	Admissions from scurvy.	Mortality from all other causes.	Mortality from scurvy.
NATIVE TROOPS - (Strength, 7,044) 2,843	1,277	38	21
NATIVE FOLLOWERS— (Strength, 9,750) 4,451	1,008	54	14
BRITISH TROOPS— (Strength, 1,004) 510	1	7	0

If we compare these figures with one another, it is evident that the main etiological factor in scurvy disease must be in some departure from the normal of the dietary of the Indians (both sepoy and follower).

3. With regard to this dietary the following is an extract from the Standing Orders, Supply and Transport Corps, Somaliland Field Force, where the Indian troops are rationed as follows:—

Atta, 1 lb. 8 oz.
Dhal, 4 oz.
Ghi, 2 oz.
Chillies, 1/6 oz
Gur, 1 oz.
Turmeric, 1/6 oz.
Garlic, 1/6 oz.
Ginger, 1/3 oz.
Salt, ½ oz.
Meat, 28 oz. per week (men not meat eaters will receive 4½ oz. of gur a week).
Potatoes, 2 oz.
or
Onions, 4 oz.
or
Dried fruit, 2 oz.

Extras.

Rum, ½ dram U. P.
Lime juice 2 oz. per man per week } On medical recommendation.
Gur, 1 oz.

4. On analysis into proximate principles, this diet is fairly liberal as regards proteids, fats and carbohydrates, the nitrogen-carbon ratio well maintained (in the case of the meat eaters) and the calorific capacity much above what is required for ordinary work. It consists, however, entirely of *neutral* or *acid* foods, with the exception of the 2 oz. potatoes, a quantity obviously insufficient to supply the adequate amount of alkaline salts, necessary for both primary and ultimate digestion. From the absence, then, of alkaline food stuffs and the undue proportion of acid ones (even above the normal requirement of the organism) pathological changes in blood and tissues are the inevitable result, manifesting themselves by symptoms which are grouped together, by none too distinct a boundary and which are termed scurvy.

5. On analysing the dietary at home of the Indian Native, we see how unfavourably this above ration compares with it in its proportion of the alimentary principles leaving an alkaline ash. With considerable variations as to race, etc., this approximately is:—

Atta, ¾ seer.
Dhal, 2 chittacks.
Vegetables, 2 chittacks.
Meat.

Amchur, pickles, chutneys, etc., small quantities daily. Seasonal fruits as

Sugarcane,
Carrots,
Turnips,
Green gram, } as substitutes for dhal, being cheaper.

Milk occasionally.

6. On 22nd July 1903, most of the Force remaining from the last campaign were scorbutic and some twenty men came under my treatment suffering from symptoms varying in all degrees of severity, from simple alveolar hæmorrhages, to the most profound constitutional debility, with evidences of widespread organic disorganisation both in heart and muscular tissues generally.

One pint of fresh milk daily was prescribed as an extra and 4 oz. of raisins, but these latter rapidly caused dyspepsia, and so had to be discontinued.

Medicinally.—Pot. Sod. Tartrate, 15 gr. daily was administered till 10th August, when the supply was exhausted.

11th August.—Half ounce lime juice neutralized with calcium or sodium carbonate was given daily pending arrival of potassium citrate ordered from Bombay.

Nearly all the cases shewed a septic condition of the mouth, with the salivary reaction acid, and these were treated with local paints and washes as Arg. Nit. 20 gr. to the oz. and Sod. Sal.

Sp. Vin. Rect. } alternating with Sod. Bicarb.
Aq. Camph. }

Considerable improvement followed in most of the cases, but on the 15th August the supplies of Sod. Pot. and calcium carbonate were

exhausted and thus any specific antiscorbutic remedies were unavailabe. Half an ounce of vinegar was given daily to each patient, but with not much benefit, as it rapidly caused dyspepsia and colic, and hence, after seven days, administration was discontinued. The local condition in the mouth had by this date very nearly disappeared, and certainly out of all proportion to any improvement in the general constitutional symptoms, which was very slow. This, I think, clearly demonstrates the necessity in scurvy of therapy towards every individual symptom, for though the primary etiological facts would seem to be diminished alkalinity, yet concomitant and consequent changes take place, and these conditions must be dealt with before improvement is observable clinically. Unrestrained symptoms of these pathological changes are produced, which at first sight appear to be quite unconnected with the scorbutic taint.

August 22nd.—Sponginess of gums recurred in seven of the patients, which was restrained by the use of local medicaments. General muscular weakness and adventitious swellings in a few cases were noticed, and on the arrival of Pot. Citrate and Calc. Chloride from Bombay, on September 8th, it seemed advisable to at once administer it, so rapidly had the disease recurred, without waiting for the arrival of apparatus from England and India, to record the measure of improvement under its administration.

7. *September 12th.*—The glass capsules, etc., arrived and the observation began.

The semeiology of all the cases indicated at least loss of alkalinity and consequent loss of coagulability of varying severity, each pathological change accounting for its own group of symptoms, thus from loss of alkalinity, we have general muscular debility and inanition, while from loss of coagulability we have sponginess of gums and brawniness of muscular areas (apart from actual hæmorrhages).

For the measurement of alkalinity of the blood plasma, the method employed was that of A. E. Wright, by neutralizing it with dilutions of standard sulphuric acid and fixing the point of neutralization by litmus paper (in terms of N/X where N denotes sulphuric acid of normal strength).

The carrying out of this method was fraught with many errors in technique and accuracy, the latter mainly depending on—

1. Impossibility of verification by repetition, owing to limited number of capsules (220).

2. Varying alkalinity of the glass receptacles for holding the dilutions of the acid. These were watch glasses of a common type and shewed a decided alkalinity after ingestion with distilled water for five hours. To counteract this, fresh dilutions of the acid were made every ten minutes.

3. Rudimentary nature of the centrifuge for separating out the capsules. This consisted of a bottle revolving at the end of a string on a stick impelled by hand. Complete separation was impossible and this necessitated a certain time elapsing for contraction of the fibrin clot, thus presenting a serum of false alkalinity partaking of that of the capsules.

The coagulability of the blood was also tested by the method of A. E. Wright, by withdrawing it into capillary tubes graduated to contain 5 mm. fluid, and the coagulation times within these tubes measured in minutes and seconds. These times were taken single-handed and hence are liable to much inaccuracy.

Errors were thus inevitable, but the results may be of value not as indicating actual measurements of the amounts of alkalinity and coagulability, but as indicating their relative increase and decrease.

The observations were all carried out at the same time of day and bearing the same relation to food as far as possible.

The patients were divided into groups according as their symptoms suggested: (1) diminished alkalinity excessively, or (2) diminished coagulability excessively, or (3) both conditions combined.

Results shew that there is a much greater discrepancy between the loss of alkalinity as found by experiment, and the corresponding severity of clinical symptoms, but in all cases where the former is much diminished, profound constitutional disturbance, if not already in evidence, will rapidly manifest itself. No examinations of the alkalinity of the urine were attempted. There were no means for the examination of the blood corpuscles or for a blood count.

Experiments on the toxicity of the serum could not be undertaken.

8. GROUP 1.—Two Sepoys (Pathans).

Semeiology.—Slight sponginess of gums, slight brawniness of both solei and popliteal spaces and great muscular debility, and inability to walk unaided. Pain on pressure in both legs.

Treatment.—Pot. Cit., 80 gr. } *Daily.*
Calc. Chlor., 10 gr. }

U. K.			B. K.	
In addition heart dilated, bruits probably hæmic, sounds weak and rhythm pendulum-like pulse irregular and weak. Tinct. Stroph. Tinct. Caps. *aa.* 5 mm. twice daily.			Dyspepsia obstinate. Sod. Carb. administered.	
	A.	C.	A.	C.
Sep. 13	N/57	5·40	N/64	4·58
,, 21	N/52	5·44. Heart condition improving.	N/60	4·55
,, 29	N/50	5·29	N/55	4·30
Oct. 6	N/48	.....	N/50	4·22 Sponginess of gums absent.

	U. K.		B. K.	
	In addition heart dilated, bruits probably hæmic, sounds weak and rhythm pendulum-like, pulse irregular and weak. Tinct. Stroph. Tinct. Caps. *aa.* 5 mm. twice daily.		Dyspepsia obstinate. Sod. Carb. administered.	
	A.	C.	A.	C.
Oct. 14	N/48	4·50 Sponginess of gums disappeared.	N/48	0·4
Nov. 5	N/47	.....	N/40	Scurvy almost disappeared.
,, 10	N/42	All special scurvy conditions disappeared.	N/40	Scurvy cured.
Dec. 15	N/40	4·3. Heart condition normal.	N/37	.....
Apl. 15	N/40	...	N/42	.....

Control tests, Sep. 13th—
K.B. (Hindu.) A. N/37 C, 4·15
Self. A. N/38 C, 4·9

The rapidity of improvement of B. K. compared with U. K., suggests that a pathological process of an unknown source was at work, first, causing the cardiac symptoms, and then inhibiting any therapeutic value of the citrate of potassium.

9. GROUP 2.—Three men.

Semeiology.—Sponginess of gums, excessive brawniness of muscular areas especially in flexors and extensors of the thigh and popliteal spaces and subperiosteal swellings.

Treatment—Pot. Cit., 15 gr. } *Daily.*
Calc. Chlor., 30 gr. }

	N. M.		C.		H. S.	
	Subperiosteal effusions in R. tibia and L. ulna.		Great swelling of both ankles and of dorsal aspect of L. foot.		Four scorbutic ulcers on the anterior aspect of L. leg. Subperiosteal nodes on R. radius.	
	A.	C.	A.	C.	A.	C.
Sep. 15	N/48	8·45	N/52	7·15	N/50	8·0
,, 19	N/45	.....	N/55	.....	N/50	.....
,, 27	N/46	7·0	N/53	6·39	N/47	7·47
Oct. 1	N/45	.....	N/48	.....	N/47	Periosteal nodes disappeared.
,, 9	N/42	6·58	N/45	.....	N/42	5·52. Ulcers quite healed.
,, 13	N/37	.....	N/42	5·42	N/43	.....
,, 25	N/37	5·4	N/38	Swellings absolutely disappeared	N/41	Gums quite normal.
Nov. 1	N/37	Scurvy disappeared	.....	.....	.....	.....
,, 15	.....	4·35	.....	4·42	.....	3·35
April 15	.....	.....	.....	.....	.....	.....

10. GROUPS 3, 4 AND 5.

All patients included under these groups suffered from all the ordinary manifestation of the scurvy disease, with no observable variations in severity among them.

11. GROUP 3.—Two followers (Hindu Muss.)

Treatment—Pot. Cit., 30 gr. } *Daily.*
Calc. Chlor., 15 gr. }

	P.W.		N.B.	
	A.	C.	A.	C.
Sep. 16	N/64	7·15	N/60	6·58
,, 25	N/62		N/60	.....
Oct. 1	N/55	Softening of brawny areas.	N/58	.....
,, 12	N/55	.....	N/55	... ..
,, 24	N/55	.....	N/50	... ..
,, 29	N/53	.....	N/50	.....
Nov. 2	N/47	.....	N/45	
,, 15	N/43	No signs of scurvy extant.	N/43	No sign of scurvy extant.
,, 30	N/41	3·58	N/43	4·25

12. GROUP 4.—Two men (Pathans).

Treatment—Pot. Cit., 15 gr. } *Daily.*
Calc. Chlor., 15 gr. }
Milk, 3 pints.

	H.K.		D.K.	
	A.	C.	A.	C.
Sep. 16	N/62	7·40	N/60	6·15
,, 19	N/62	.....	N/60	.....
,, 23	N/55	.....	N/58	.....
Oct. 1	N/54	.....	N/54	.....
,, 5	N/54	.....	N/53	Sponginess of gums disappeared.
,, 13	N/50	Sponginess of gums disappeared.	N/48	
,, 26	N/50	... ..	N/48	.....
Nov. 2	N/47	No brawniness remaining.	N/45	.....
,, 14	N/45	.....	N/43	...
,, 29	N/40	4·51	N/41	3·42

There is thus apparently a considerable therapeutic value in milk combined with Pot. Cit., containing as it does, 1 grm. per litre citric acid (Henkel), thus 3 pints milk=1 oz. lime juice in terms of citric acid. That the milk alone is a poor curative agent may be inferred from the fact that all these men had, from July 24th to 12th September, been supplied with one pint daily and still on the latter date their alkalinities were diminished, N/64–N/48.

13. GROUP 5.—Two men.

Treatment—Pot. Cit., 15 gr.
Calc. Chlor, 15 gr.
Fresh meat juice from 8 oz. meat.

	S. K.		S. S.	
	A.	C.	A.	C.
Sep. 16	N/58	6·15	N/55	8·11
,, 25	N/55	.....	N/50	.....
Oct. 1	N/55	.....	N/50	... ..
,, 8	N/50	.....	N/48	.....
,, 14	N/43	Sponginess of gums absent.	N/42	Sponginess of gums quite absent.
,, 24	N/45	.....	N/42	.....
,, 29	N/44	.....	N/45	.....
Nov. 4	N/40	.....	N/41	.....
,, 10	N/39	4·7 Scurvy completely gone.	N/40	5·10. No signs of scurvy.
April 15	N/40	.....		.....

The meat juice administered, was obtained by digestion, after mincing through an ordinary machine, with cold water, and allowed to remain there for three hours; the meat was afterwards strained off and cooked and the fluid administered by itself. The anti-scorbutic value of fresh meat, due to salts of lactic acid (Parkes), was thus preserved, and the rapidity of improvement testifies to its high therapeutic value.

14. GROUP 6

Contains two men, who are but individual examples of a great number of cases met with in dealing with an extensive scurvy morbidity, cases in which ordinary curative agents appear to be less efficacious than analogy would lead one to expect. These are cases as U. K. in Group 1, in which the symptoms suggest a toxæmia, causing a neuritis sometimes peripheral, sometimes cardiac. A perfect picture of this neuritis, as in beriberi, is probably seldom observed, but isolated symptoms are very suggestive of a similar condition. These two cases shewed no great disorganisation of gums and no extensive boarding of muscular areas (though both these were present), but neuritic conditions were present, which are difficult to explain otherwise and which cannot fail to be interesting.

Treatment—Pot. Cit., 15 gr.
Calc. Chlor., 15 gr.
Fresh meat juice (8 oz. meat).
Fresh milk, 1 pint.

B. S. (Rajput). B. K. (Pathan).

R. toe drop. R. kneejerk absent. L. kneejerk decreased. No ankle clonus on either side. Superficial reflexes increased, especially on the right side. No patches of anæsthesia anywhere. Heart dilated 5½—4¾ rhythm. Pendulum-like palpitation, dyspnœa. Intermittent fever almost daily (malaria could not be excluded).

Heart symptoms normal. Right and left toe drop. Patches of anæsthesia over R. tibia. Superficial reflexes on both sides increased. Kneejerks absent on both sides. Intermittent fever.

	A.	C.	A.	C.
Nov. 15	N/51	.....	N/58	.....
,, 20	N/50	.....	N/55	.....
,, 27	N/48	.....	N/55	.....
Dec. 1	N/47	Sponginess of gums slowly improving.	N/57	.....
		.....	N/55	
,, 5	N/50	Sent into Hospital Shiekh.	N/53	No improvement in neuritic condition, except slight increase of muscular strength.
,, 9	N/49			
,, 10	...	Said he was feeling quite well.	N/51	Slight improvement generally.
,, 11	...	.....	N/47	Sent into Hospital.
,, 13	...	Died suddenly. No autopsy.		On Jan. 15, 1904, invalided to India.

The obstinacy to yield to treatment will be noted.

15. The general analogy of similar conditions points to the alimentary canal being the seat of the toxin production, as Hamilton Wright has recently shewn in the case of beriberi.

That toxins there produced play an important part in many febrile conditions leading to blood destruction at present little understood is obvious from the researches of Ewald, Baumann, and Metchnikoff. From the absence of any epidemic nature of scurvy disease and its certain onset after a dietary of insufficient alkaline food stuffs, it is certain that there is no new specific organism introduced into the system, as in beriberi, but that the toxæmia, if toxæmia it be, is due to bacteria normally present in the alimentary canal, but which have taken on an abnormally active development, and toxin formation consequent on the diminished vitality of the mucous membrane there and a diminished bactericidal power of the tissues generally.

If we compare the immunity from toxæmia in health although the intestine be swarming with B. coli and other organisms and the rapidly fatal toxæmia resulting from an injury traumatic or otherwise to the intestinal wall, we can see it is not inconceivable to suppose that once a suitable nidus is established in the canal from lessened vitality, a similar toxæmia may be the result, but, owing to the constant presence of these bacteria within the body, a certain amount of immunity is normally present, and hence the symptoms are more gradual and obscure.

In infections and acute intoxications, blood alkalescence is diminished (Labbe), and as a condition of diminished alkalinity certainly predisposes to bacterial infection, the disease is thus aggravated.

If this view be correct, then we have indications for treatment, which may prove to be of great value, in the exhibition of intestinal antiseptics—salol, aspirin, etc., along with the specific agents mentioned above.

Observations as to their uses are now proceeding. Injections of alkaline fluids into the blood stream and subcutaneously are now also being given a trial.

16. In all these cases, lime juice was rigorously withheld, as it seems clear that though the juice of fresh limes is of service, still that which has been barrelled for some time and which has decomposed into carbonates and free citric acid (requiring for 1 oz. 95 gr. anhydrous Sod. Carb. for neutralization) can be of no avail.

This lime juice then serves to disturb primary digestion inhibiting the secretion of acid in the gastric juice and to astringe the mucous membrane. This can be ill afforded in the case of the Indian who requires a large proportion of condiments daily to stimulate the digestive apparatus. It also precipitates out of the blood the calcium salts, which are available for coagulation, thus reducing blood coagulability (Wright and Knapp) and increasing transudations and the already distressing symptoms.

In the case of British troops, where the dietary contains a sufficiency of other calcium foods, lime juice may be of more value, but the non-prevalence of scurvy among these is not dependent on its consumption, as if the truth were known not 1 in 100 ever touch their ration of it, knowing that colic and dyspepsia are the inevitable result. With a view to corroborate this, lime juice was administered day by day, 1 oz. to two men (Pathans), who had never suffered from scurvy in the least.

In 16 days I succeeded in reducing their coagu- m. s. m. s. m. s. m. s.
lation times from 4-10 and 4-14 to 7-15 and 5-15.

17. From the extremely limited number of cases under observation, the information as to the relative values of the curative agents employed must be of little practical value, nevertheless the marked improvement under administration of *fresh meat juice combined* with Pot. Cit. and Calc. Chlor. may indicate lines of future investigation.

18. Obstinacy in the face of treatment, in some cases, appears to depend on the natural powers of assimilation of the alkaline salts required daily presented to them. These latter are supplied in the form of lactates to the meat-eating Pathan, and as tartrate, etc., to the vegetable-eating Hindu. The inference then is, that Pot. lactate must be given to the former, and Pot. Cit. to the latter, to obtain the maximum therapeutic value.

From the analogy of the comparative values of chalybeate waters and iron salts in chlorosis, it is needless to point out that, in the case of blood disease, it is the method of presentation to the system of the drug supplying the deficiency that is all important.

19. As to prophylaxis, it would be advantageous to omit lime juice from the dietary altogether; it is bulky, requiring much transport waste; it is non-palatable, and hence largely thrown away; from the above remarks, it appears to be useless. From the view that the work on service may be classed as hard, the meat ration might be increased. The substitution of haricot beans for dhal would serve to keep up the nutritive value of the diet in countries where the water is hard, as then it is impossible to cook it. Pickles would be a very useful addition to the diet from their anti-scorbutic value. The establishment of gardens along the line of communications, wherever rendered practicable, by the existence of water, and kept up by units and depôts for their own use. The cost of seeds, implements, etc., would be neutralized many times over, by the improved health of that unit.

It appears obvious that drugs, whose pharmacological action is known to be antagonistic to the development and causation of a disease, must be available in plenty for prophylaxis, with a view to campaigns, in countries where supplies of vegetables and milk cannot be depended on. Tabloids of Pot. Cit. or Pot. Sod. Tartrate 5 gr. and Calc. Chlor. 5 gr. would appear to be theoretically efficient for this purpose. These should be coloured blue and red, to avoid confusion, and administered two or three times a week, or even daily. Single tabloids of Calc. Cit. might be substituted for the above. The necessity of convincing the sepoy of their efficacy must be impressed on the officers commanding regiments and units.

Since the above was written the results of some obervations, conducted by Captain Bhola Nauth, I.M.S., in the General Hospital, Berbera, are very interesting. These compare the relative values of fresh lime juice, with the commissariat lime juice, and in the cases observed, the therapeutic value of the former was clearly demonstrated. Potassium citrate alone, milk, fresh meat juice were all tried in a limited number of cases, but no such improvement followed their administration as under fresh lime juice. These results, I understand, will be published shortly.

FROST-BITE IN THE TIBET MISSION FORCE.

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THE following notes on the subject of frost-bite are the result of observations made during the winter of 1903-4 and the spring of 1904 in the Chumbi Valley, on men serving with the Tibet Mission Force, and also in some cases on the inhabitants of the valley itself.

Though the disease is naturally never met with in India Proper, the subject may in the future assume considerable importance, as other expeditions may have to penetrate to equally cold regions with those in which these observations were made.

Paradoxical as it may seem, there is no doubt that very often the more serious results of frost-bite are directly due, not to excessive cold but to carelessly applied heat. The pathology of the disease, however, explains this apparent paradox.

The prime cause of the condition, however, generally was damp clothing combined with extreme cold. Simple dry cold being seldom a cause of frost-bite by itself.

The pathology of the disease is as follows:—

First Stage.—The cold causes great contraction of the peripheral arterioles, and the affected part, at first painful, becomes gradually numb.

Second Stage.—Complete expulsion of blood from the affected part owing to contraction of the tissues themselves due to the cold.

The affected part now becomes absolutely without feeling of any kind.

Third Stage—Simple death.—The cold may be so long continued and severe that the affected

part dies, and passes directly into a state of dry gangrene.

Death from heat.—This, amongst the cases occurring in the force, was the most usual cause of severe results. The men affected used to hold the frost-bitten part practically in the fire, as a result, violent rapid œdema occurred, with severe pressure on the already damaged tissue causing its death; this was followed by moist gangrene of the part.

Recovery.—This may be complete or partial, and will be described under the headings of "amount of injury" and "treatment."

Amount of Injury.—The amount of injury may be divided into three grades of severity:

Grade I.—Simple death of the superficial layers of the skin, with peeling of the dead tissue later. Recovery is slow, but no permanent ill result remains.

Grade II.—Death of the whole skin and sometimes of the superficial fascia. Recovery results in great scarring and deformity.

Grade III.—Death extending to the deeper tissues, muscles, tendons, etc. This results in complete loss of the part.

Condition on Examination.—If the case is examined during the two earlier pathological stages, the affected part is cold, white and painless.

If seen in the third stage, either simple dry gangrene or the moist variety is present, the latter often being complicated at quite an early stage by emphysema.

Treatment.—This of course varies with the stage of the disease.

During the first stage.—By far the best treatment is massage, and after the circulation is to some extent restored, as shewn by redness of the part, pain and "pins and needles," the application of lukewarm water.

During the second stage.—It is in this stage that treatment is of the most value, and the following methods are recommended:—

First, friction and careful massage may be tried either dry, or with oil or vaseline to render the massage more efficient.

If this fails alone, the affected part may be immersed in ice cold water, and the vessel containing the water placed near, but not on, a fire and very slowly warmed, friction and massage being kept up all the time.

Another method by which I got good results in a couple of foot cases, was by wrapping the affected part very thickly in wool and bandages and covering it in a box with warm sand.

In all methods the warmth must be applied *very* slowly, or œdema and moist gangrene will result. For this reason friction is by far the safest treatment, but unfortunately not always successful alone.

Internally I generally administered warm drinks or gruel, and more rarely gave a very small amount of stimulant—either rum or brandy. The patients were always well wrapped in blankets, but never allowed close to a fire.

During the third stage.—These cases always needed operative treatment. A few cases which refused operation, even when only slightly injured, all went to the bad.

After some time I found the best methods of treatment were as follows:—

Dry Gangrene.—As soon as the skin got black I anæsthetised the patient, and carefully removed the blackened skin; there was generally a little pus present underneath it. Often this was sufficient, the tissue beneath being found to be quite healthy.

If the tissue underneath was unhealthy, but not actually dead, I dressed the part with warm antiseptic, and waited for the case to develop.

If, however, on removing the skin, I found the part was completely gangrenous, I amputated at once just above the dead tissue. I found there was no necessity to wait for an absolute line of demarcation, as any tissue, not actually dead, did well as a flap.

The point I wish particularly to bring out is the advantage of first removing the dead skin, and also of doing so as early as possible. As a finger or toe, apparently quite dead, will often be able to be completely saved by removal of the dead skin, as the damaged tissue beneath will then rapidly recover, while if the skin is not removed, total death of the part generally ensues.

Moist Gangrene.—These cases admitted practically of nothing but amputation. And as the gangrene showed little inclination to spread beyond its original limits, and as at first that limit was difficult to exactly define, I always waited for a line of demarcation to form, and then amputated. They were always quite hopeless to treat except by amputation, death of the part invariably being complete.

In my account of the treatment adopted, I have made no distinction between different extremities, *i.e.*, hands and feet, as the treatment adopted in each case was the same.

Prevention.—No note on frost-bite can be considered even moderately complete without some mention of the methods of preventing the onset of the disease.

The following rules for this purpose may be laid down:—

Rule I.—When the hands or feet feel painfully cold, they should respectively be swung about and slapped, or stamped on the ground, or, if a fire is near, carefully warmed.

Rule II.—If painless from cold and therefore in a worse state, they should be briskly rubbed until circulation is completely restored. They should not be warmed at a fire.

Rule III.—On arrival in camp all socks and gloves should, if possible, be changed, and warm dry ones put on. In the case of the feet, warm boots of some kind should also be worn after arrival in camp.

Appendix.—In the above notes I have tried to emphasise the chief points I noticed in the

disease, in the hope that they may be of use to other medical officers at high altitudes and when extreme cold is experienced.

For the rules for prevention I am indebted to the orders issued by the P. M. O. (Lieutenant-Colonel Waddell, C.I.E., I.M.S.) on the subject. I have not noted that boots and gloves should be worn, though, when dealing with native followers, this rule ought also to be added and it was added in the orders issued to the force.

THE PREVENTION OF TUBERCULOSIS.

By W. E. JENNINGS, M.D., D.P.H.,

MAJOR, I.M.S.

THE success which has attended the experiments of McFadyean and Von Behring, in immunizing cattle against tuberculosis, bids fair to revolutionize the somewhat elaborate and often impracticable prophylactic measures which have been for some time in vogue, and still take such an important place in our never-ceasing struggle against the disease.

After many futile attempts to confer immunity by the injection of products of tubercle bacilli, recourse was had by these gentleman to the employment of attenuated cultures, and such was their success that there is no longer any doubt that absolute immunity can be expected by the inoculation of young cattle, if these be free from infection when first treated.

Such immunity, as described by Von Behring in "*La Semaine Medicale*" (*vide* translation by Staff Surgeon Andrews, R.N., in *Journal of State Medecine*, 1904), is evidenced by the facts that the animals possessing it resist doses of tubercle culture which are fatal to non-immunized animals; that they do not re-act to tuberculin; and that, though exposed to the risk of natural infection by association with infected animals, they do not contract the disease.

It now remains to extend the principle to human beings; but there is the great drawback that general application can never be expected so long as the necessity exists for the employment of live cultures, however much attenuated.

It is, nevertheless, claimed that the milk of immunized cows contains anti-bodies, which, by passing into the circulation, establish protection among infants so fed; a very large measure of indirectly acquired immunity among human beings may thus be expected—seeing that according to Heller, Ravenal, von Behring, Hueppe and others, one of the principal sources of tuberculosis among such is the milk which is consumed during infancy (when, as Disse and Smelin have demonstrated, the enzymes and epithelium of the intestines are insufficiently developed).

Until, therefore, some means can be devised for establishing a system of inoculating human beings, advantage should be taken of the importance of feeding young infants with the milk of immunized cows, and efforts should be made to so preserve the immunizing substances therein as to enable them to be kept or sent abroad without risk of deterioration.

The sensational declaration, made by Koch at the British Tuberculosis Congress in 1901, to the effect that the disease is not identical in animals and men and not reciprocally transmissible, is doubtless fresh in most minds; and the impression he created might tend to make many sceptical as to the possibility of establishing either direct or indirect immunity among human beings; but, fortunately, there is overwhelming evidence to show that his surmise requires revision.

The facts upon which it was based appeared, at the time, to be sufficient to indicate that the infection of human beings from cattle was extremely rare; *e.g.*, he pointed out that if the large quantities of bovine tubercle bacilli which abound in the milk and butter of large cities were able to infect human beings, most human consumptives would suffer primarily from intestinal tuberculosis; but that, among the many cases of tuberculosis examined by him after death, he only remembered having seen primary tuberculosis of the intestine twice; that, among the great *post-mortem* material of the Charitè Hospital in Berlin, only ten such cases were observed in five years; that, among nine-hundred and thirty-three cases of tuberculosis in children, Baginisky never found tuberculosis of the intestine without simultaneous involvement of the lungs and bronchial glands; and that, among three thousand one hundred and four *post-mortem* examinations on tuberculous children, Biedert only observed sixteen cases of primary intestinal tuberculosis.

It has, however, since been established beyond doubt that the nature of the primary manifestation of infection does not in any way necessarily depend on the mode of ingress of the virus, but that the least resistant organs are most likely to primarily suffer, the infection being conveyed by the lymphatics or blood stream. Weleminski, working with Hueppe (*vide* Harben Lecture, III, *Journal of State Medecine*, January 1904) has demonstrated that rabbits infected by nutrition in many cases only exhibit tuberculosis of the lungs; Baumgarten has produced pulmonary and intestinal tuberculosis in rabbits and guinea-pigs, respectively, by inoculation through the bladder, or subcutaneously; Ravenal gave calves tuberculosis of the lungs by feeding them with infected food; and pigs commonly contract pulmonary tuberculosis through the alimentary canal.

Setting aside, however, the question of the relation between the nature of the primary manifestation and the mode of ingress of the virus into the body, there are other facts which justify the deduction that animal and human

tuberculosis are identical. Hueppe, Orth, Wolf, Arloing, MacFadyean and others (*op. cit.*) have frequently successfully infected cattle with human tuberculosis; MacFadyean has immunised cattle with cultures of avian tubercle; apes (according to Boyce and Grunbaum) can be infected equally well with cattle and human tuberculosis; Karlinski has shown that different races of cattle exhibit different degrees of susceptibility; Fischl, Nocard, and Vagedes have cultivated from apes, horses, and men, respectively, bacteria similar to those of avian tuberculosis; Von Behring, after failing to infect cattle with human tubercle, has succeeded, by first passing such through the body of a goat, etc., etc.

It is true that marked differences in morphological characters exist between the organisms of human, animal and avian tuberculosis; but, in the light of the above and many other facts, it is evident that such differences are merely the outcome of adaptation.

The hope, therefore, that a solution of the question of immunity is within measurable distance need neither be abandoned nor weakened by any such idea as want of identity between cattle and human tuberculosis, and no effort should be relaxed to secure such a consummation.

In his earlier experiments (*op. prim. cit.*) Von Behring brought about immunity in cattle by a long series of gradually increasing doses of culture, but latterly he has limited the number of doses to two, with an interval of a month between each. The material injected is a culture of human tuberculosis in glycerinated serum, completely desiccated in a vacuum at ordinary room-temperature, triturated in an agate mortar, and made into an emulsion with one per cent. saline solution. Both inoculations are made into the jugular vein, the dose of the first being 0·004 gramme, and that of the second 0·01 gramme. The first has no effect upon healthy animals, but causes a severe reaction in those suffering from tuberculosis.

It must not be lost sight of that the palliative measures which have been in force for so many years have resulted in a marked diminution in the incidence and mortality from the disease. We are reminded by Dr. Heron (*British Medical Journal*, April 1904) that, though the population of England and Wales has increased during the past 35 years by 50 per cent., the mortality from pulmonary tuberculosis has fallen 50 per cent.; there are nevertheless, from 300,000 to 500,000 people at present infected; all existing measures therefore should be persevered in coincidentally with efforts for organizing means for establishing immunity; more specially as the greater bulk of those affected belong to people of the poorer classes, whose intelligent co-operation it is too often either impossible to secure, or, amongst whom opportunities and means are too limited to enable them to adopt, without public help and properly organized institutions, the precautions which are necessary for the safety of the community.

In some parts of the continent of Europe and the United States of America, legislation regarding tuberculosis follows the same lines as that in force for other forms of infectious and epidemic disease. In Germany there is a system of industrial insurance, whereby every working man and woman is compelled to pay a percentage of his or her wage into a fund (subsidized by Government and also supported by employers of labour) set apart for maintaining measures for the prevention and suppression of tuberculosis.

Compulsory notification is being adopted throughout the United States; and, regarding England, Dr. Hillier writes: "So urgent has the need for notification of phthisis been felt to be by a number of Medical Officers of Health in England, that a system of voluntary notification has been adopted in numerous districts, such as Brighton, Manchester, Kendal, Finsbury and other places, and has been attended with success. The usual fee which is paid to medical men when notifying other infectious diseases has been granted in the majority of instances, and the legality of these payments has been recognized by the Local Government Board. The Medical Officers of Health for these districts are unanimous in their testimony as to the value, both for statistical purposes, and for further measures of prevention, to be attached to this system of voluntary notification." In New York voluntary notification was in force for three years before compulsory notification was started; 4,166 cases were notified in the first year; 5,824 in the second year; and 8,339 in the third year.

Besides legislative measures, too much stress cannot be laid on the great importance of a system of educating the people and securing their co-operation by impressing upon them that they are not only a source of danger to others, but also to themselves, as their own sputa may possibly infect their own sound lung tissue. Dr. C. P. Ambler, in an article in the *Medical Record* (December 1903), has published a list of points, which should be observed by the family of a tuberculous patient, giving useful hints under each as to the procedure which should be adopted to give effect thereto. A recapitulation of some of these points should not be out of place here, the following being among the most important, *viz.* (1) the disposal of expectoration, which should be kept moist till it can be disinfected and destroyed; (2) the careful washing and boiling of eating and drinking utensils used by those affected; (3) the arranging and furnishing of sick-rooms in such a manner as to minimize suspended dust; (4) the avoidance of kissing; (5) the danger of allowing patients to handle such food-stuffs as are to be eaten unwashed and uncooked by healthy persons; (6) the prohibition

of coughing at a dining table, or in rooms with carpets, rugs, or matting; (7) properly adapted ventilation; (8) precautions to prevent inoculation through wounds or abrasions both in the case of adults, and in that of infants crawling about floors; (9) the avoidance by the affected of public halls and crowded gatherings; and (10) the periodical medical examination of all members of the affected family.

With reference to the last point, the responsibility of the physician comes into evidence; and we are reminded by Professor Baumler in an able article on the early diagnosis of tuberculosis of the lungs (*British Medical Journal*, April 1904) that, if by the progress of our knowledge of pulmonary phthisis, and of the possibility to battle against it, the power of the physician has been greatly extended, his responsibility also has enormously increased, involving, as it does, the paramount duty, if possible, to recognize the very earliest manifestations of infection. Such manifestations being in most instances purely local, the physical signs which characterize them are necessarily of primary importance; but even when none of the diagnostic methods result in any definite conclusion, recourse can be had, in doubtful cases, to the tuberculin test; this, according to Dr. Baumler, is best employed in accordance with the following method, which is observed at the Institute for Infectious Diseases at Berlin. "The normal course of the temperature of a patient having been carefully established by measuring it for two or three days every two or three hours, a subcutaneous injection of 1 m.g. of the old tuberculin is made under the skin of the back in the evening between 6 and 8 o'clock, as the reactive rise of temperature generally begins after twelve hours. For children the dose must be smaller. After one or two days 10 m.g. are injected. A rise of temperature of at least 0·5°c. (1° F.) is considered a positive reaction. The solution of tuberculin should always be freshly prepared. Patients that are feverish should not be injected."

There also remains the serum test of Arloing and Courmont based on the property exhibited by the bacilli in a pure culture of becoming agglutinated in the presence of the serum of tubercular individuals; but Dr. Baumler does not consider this a method suitable for daily practice, even with the improvements which have been introduced by Koch.

We thus have at our disposal measures which, however difficult of application and however costly, have been successful in considerably reducing the incidence and mortality of the disease. A very much more powerful and rapidly acting agent is being laid at our doors as the result of MacFadyean's and Von Behring's researches; and lastly, we are beginning to recognize, with justifiable certainty, the fact that phthisis is no longer a necessarily incurable disease.

PLAGUE: A SOIL INFECTION.*

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THE fact that we have now had plague with us in India for the past seven years, and that it is still killing people here (according to the official figures, which must necessarily be somewhat below the mark) at the rate of seventeen thousand a week, appears to have given rise in the lay mind to the remarkable conclusion that the systematic study of the ætiology of plague epidemics is a matter that calls for encouragement and support. As it appears likely that we may now see an effort made to enquire into the conditions, characters, and necessary environment of the *baccillus pestis* external to the body, it may be of interest to consider, for the purpose of eliciting further information by criticism, the lines on which the investigation might run. We know a good deal, though much remains to be learnt, of the action of the bacillus, its shape, characters, and toxic products, when demonstrated in its parasitic condition in living animal tissues. We know too little, and in fact we know nothing, of its characteristics as a saprophyte in nature. It has long been known that the bacillus is extremely polymorphic. Grown in laboratory cultures it rapidly alters its shape from the typical polar-staining cocco-bacillus, into chain-forms, rod-forms, bulbous rod-forms, filaments, dumb-bells, globes and even thick branching rods; and these involution forms appear in varying amounts in different culture media and different ages of the growths. We also know that some of these modifications of the original type revert to their former shape, and standing characters (though not, it is believed, to their former virulence) when removed from the media on which they have appeared, and grown again on agar-agar.

The polymorphism of the bacillus, and its tendency to take on changes in shape, staining reactions, toxicity and culture effects, from what we regard as the normal, appears to me to open up problems regarding the condition of the micro-organism in a saprophytic condition, the elucidation of which should be attempted. We wish to know whether the involution forms which we can produce by methods which only in a very inadequate manner mimic the conditions under which the bacillus may flourish in external nature, represent forms under which the bacillus may remain latent or non-virulent for long periods in houses, clothing, some host other than man and rodents, or the soil. Or if it be demonstrated that in a town which has suffered from one epidemic and has remained quite free for months, but again becomes the seat of the pestilence, evidence of definite infection through some imported case is always forthcoming, and that there is no such thing as plague re-appearing spontaneously in a previously infected district under seasonal or other variations, then the question arises—what are the peculiar local conditions which favour the occurrence of an epidemic after definite periods of quiescence, or at definite seasons of the year in a particular locality! For instance, in Bombay, the winter months show exacerbations of the disease; we speak of "the usual cold weather epidemic;" but in Poona the epidemic appears to recur (roughly) eight or nine months from the subsidence of a previous epidemic and at no particular season of the year. Changes of temperature and the like cannot be the essential factors in the rise of the plague mortality in a district; there must be peculiar local causes at work which we do not at present understand. And these local causes are not altogether dependent on overcrowding, filth, ill-ventilation of houses or a debilitated population. At the end of every epidemic there is a period of local immunity. What happens is

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that at the height of the epidemic the panic induces those people, who can do so, to remove themselves into the surrounding districts. They carry the disease there with them, and on the town epidemic subsiding, they return at the earliest possible date in large numbers. The overcrowding that existed before the general exodus is the same, in fact it may even be exaggerated, as many of the houses will be found to be unroofed, or partally demolished, through the usual plague operations. The sanitary arrangements that obtained before are continued; and they are probably worse, as an adequate conservancy establishment may not be available. Yet, though cases of plague are brought back from the districts, there is no spread of the disease at all until the usual period of quiescence has elapsed. This is not because the returned population has been rendered more hardy or resistant to disease by their stay outside their town. The large majority of such a population has always lived up to "the margin of subsistence," and during their sojourn "in the jungle" have had to subsist as best they can from day to day. Anyone who has been in a position to examine scientifically the general state of health of the poorer classes of the native population after their return to a temporarily evacuated town, must have been struck with the debilitated condition of this class, and their lessened power of resistance to disease other than plague, and this is a point which I have recently had an opportunity of noting in Mhow.

I am prepared to state the following as a law for the occurrence of plague epidemics in India:—In a population previously free from plague, or free from plague in epidemic form for a period of seven to nine months (*the period of quiescence*), there occur, at irregular intervals and at scattered points, deaths from acute septicæmic, pneumonic, intestinal, cerebral, or puerperal plague, which escape identification as such until the occurrence of one or two instances of the typical bubonic form calls attention to these antecedent mysterious illnesses. This is the *stage of sporadic typical cases*. After the lapse of twenty or thirty days, one, two, or three cases of indubitable plague occur in houses contiguous or nearly so, in one of the localities which have been infected, and among people who have not come in contact with one another. This is *the stage of local place infection*. After a period of from one to two months this locality shows dropping cases of plague at the rate of one every three days or thereabouts. This is *the early epidemic stage*. The houses become infected in a certain order slowly, but surely, *i.e.*, the infection runs down one side of a street in one direction only, or it runs through a group of houses in one direction only, sparing houses to right and left. In two or three weeks the number of cases rises with comparative suddenness (the local epidemics fusing) to the total of thirty or a hundred a day, according to the number of the people in the area, the degree of congestion of the population, the degree of insanitation, absence of measures for evacuation, and other factors. This is *the fastigial stage of the epidemic*. The fastigium lasts for two weeks or more and then a rapid decrease in the daily returns takes place, till one or two cases only occur per diem (*the stage of decline*), and this gradually drops to zero. This diminution in the daily total of cases is more rapid than the rise from the early epidemic stage to the fastigium. The *period of quiescence* then sets in and lasts for seven to nine months, and if there are imported cases during this period, there is no spread of the disease; the period of quiescence representing a state of local immunity.

If any one knows of any exception to the last sentence of this statement I should be glad to hear of it. This, be it noted, does not mean that the curve of a plague epidemic in a town would be represented by a straight line; there might be several wide oscillations during the fastigial stage. The descending lines would not signify that the epidemic was dying down, but that the disease was creeping from an area where circumstances were favourable to its spread through another where the conditions were less favourable. And the ascending lines would show that it had arrived at another part of the town where the surroundings were once more favourable. It cannot be certainly known to the plague operators that they have reached the commencement of the stage of quiescence till the returns have been at zero for a week or ten days.

The problem before us is to attempt to find out the position and condition of the plague bacillus in nature during the latter portion of the period of quiescence, where it is probable, though not proven that it exists in the state of a facultative saprophyte. In the elucidation of this, bacteriologists with their laboratory experiments, so far from helping us, have only served to make confusion worse confounded. For instance, take the question of infected clothing. There is hardly anything better established by observation and collation of facts than that clothing may contain the virus of plague, carry it over long distances, and give rise to epidemics many weeks or months after it became infected in the original epidemic area. And yet there are brought before us experiments by most careful observers, which tend to show that plague bacilli deliberately inoculated in the laboratory from virulent cultures into pieces of clothing rapidly disappear therefrom. On the other hand, there are equally dogmatic assertions made from experiments on the other side.

Again, take the question of the manner in which rats become infected with the disease. One of the earliest experiments in this connection was the feeding of rats with the organs of patients who had died from plague, and on the fragments of the bodies of rats dead of the disease, with positive results. Here is a dogmatic statement from a well-known text-book on Bacteriology: "Rats and mice can also be infected by feeding either by pure cultures, or with pieces of organs from cases of the disease, and animals infected by inoculation may transmit the disease to healthy animals kept along with them." Here is a counter-statement from a laboratory: "Experimental evidence of the infection of the rat through the channel of the alimentary canal is somewhat at variance. Dr. Gibson's experience in this connection is particularly striking. He fed ten rats on small bundles of corn wrapped in pieces of gunny bag, and then soaked in broth cultivation of plague, which was sufficiently virulent to kill in 36 hours when inoculated hypodermically into rats in the dose of 1 c.c. The bundles of corn were given to the rats in a moist condition, and the supply was maintained for a fortnight. At the end of that time the rats had consumed each 100 to 150 c.c. of plague culture. Subsequently with a view to testing their retistance, they each received hypodermically 1 c.c of the original culture, with the result that they all died of plague within 36 hours." There must have been some radical difference between Dr. Gibson's negative experiments and those which produced plague in rats fed on the decomposing flesh of cases dead of plague; and it is open to us to suggest that this was, that while in the Bombay experiments the animals received the plague bacillus alone, in the positive experiments the rats received the plague bacillus plus the micro-organisms of putrefaction co-present. And the same idea suggests itself if one believes, as I do, that rats become infected (not entirely, but to a great extent), from gnawing the decomposing bodies of their own species dead of the disease, lying about in empty sheds and houses, or within the soil inside the rat-holes. In other words the laboratory experiments with regard to the infection of clothing, and the infection of the rat *vid* the alimentary canal, do not correctly repeat the state and the environment of the plague bacillus which obtains in nature.

It may be conceded, therefore, that until bacteriologists take more pains to exactly imitate the conditions that obtain in external nature, their experiments will not help us much.

Next we should consider the question as to whether the rat infects man or man the rat. My view is that

the rat is infected from man indirectly through the infection of the house and the soil, and that the rat is only an important factor in disseminating the plague germs in the soil after local place infection has commenced. When in the early epidemic stage people see the rats "coming out of their holes, and tumbling about in the sunshine as if intoxicated," they forget that the stage of sporadic atypical cases has been passed by for six weeks or more; that in this animal the incubation period is much shorter than in man; and that the disease is much more rapid in its course, being a primary septicæmia from the outset; and they consequently come to have a settled conviction that the epidemic in the rodents precedes the disease in human beings. I repeat that dead rats are only found at the stage of "local place infection," and that in many epidemics diseased and dead rats have been hunted for in vain. And if one believes that the poison lurks in the house, or in the soil around and beneath it, and remembers that these animals are most susceptible, and that they live, so to speak, within the soil, it is precisely at this stage that one would expect infection to begin to spread among them. It was not until the disease in man, during the outbreak in Glasgow, had been so skilfully and successfully dealt with, that the infection was found among the rats. The theory, that an epizootic in rodents is the cause of an epidemic among human beings, is a pernicious theory, not so much because it is only half true, but because the modern tendency to put rat-destruction in the forefront of preventive measures diverts the attention of the authorities from more important details.

A recent theory which appears to have rather taken the fancy of the public is the flea theory. Sanitary authorities have made use of their subsidised rat-catchers, and now I suppose we shall see the utilisation of subsidised flea-catchers. Apart from the facts that the rat is infested by a particular kind of flea (*pulex pallidus*) which has hitherto not been found on man, and that if the flea were in any way a vehicle, or an intermediate host for the plague bacillus, the disease would spread eccentrically from an infected house and not in the peculiar manner to which I desire to draw attention,—the theory at once falls to the ground from the fact that plague is by no means a contagious disease. Take a plague patient out of his infected house, place his relatives in a health camp, and let these relatives attend the patient in hospital, lying, as he generally does, unwashed, in his own fouled clothes, in a not overclean bed; let them receive the sputum of the patient in their hands and dry them on their *sarris*; let them hang over the patient day and night, and in a ward full of such cases,—and the chances are very remote that they will contract the disease, unless they are already in the incubation stage themselves at the time their house was shut up, or unless they surreptitiously return to the infected house. It has been pointed out that in plague hospitals it is the dhobies who are liable to become attacked because they have to do with the infected clothing. Precisely the same thing might be said of enteric fever, and it is well known that nurses in enteric wards are liable to infection if they neglect to remove the sheets and clothing of the patients when these become soiled; but no one has yet suggested the flea as a vehicle for the *bacillus typhosus*. If the flea had anything to do with the conveyance of plague, this would be essentially a disease caused by contact, but it is not so.

Now plague has come to India within the last eight years, and it appears that it has come to stay; and the same remark applies to China. It may, therefore, be of value to consider what conditions these two countries have in common. In both there is an enormous population, a large proportion of which is crowded into cities in which sanitary efforts are decidedly primitive, in which the disposal of the excreta both of man and animals is of such a kind that the soil tends to become saturated with animal organic matter, and in which surface drainage is deficient or absent. The element of personal hygiene is absent. In India the population has, during the last thirty years, enormously increased, but the superficies of the cities and towns has not increased in the same ratio. There are many reasons for this; in some, local geographical conditions render expansion of the city limits impossible; in others, the wages earned by the poorest classes are too low to enable such rents to be paid as to give high enough interest on capital to encourage the enterprise of private builders. About the increase in the population of China of late years we cannot be precise. Anyone who has walked through a Chinese city has received ocular and nasal evidence of the degree of insanitation in which human beings can exist. The houses are low, clumsily built, windowless, and crowded; and the narrow roadway between the rows of houses is formed of a ditch covered with slabs of stone laid crosswise, through the broad chinks of which the contents of the ditch can be seen as a sluggish stream of black slimy fœtid ooze. So that in both India and China we have a soil saturated with human and animal excreta, with the subsoil water insufficiently drained; and a congested population living in close contact with such a soil, among whom the standard of health is lowered by insufficient or innutritious food, and who are crowded into houses which are deficient in light and ventilation.

By a population living in close contact with the soil, I mean people who live in houses which are built on little or no prepared foundation, and in which there is no raising of the level of the ground-floor above the level of the ground around the house, and in which the occupants sit or recline on the ground itself and do not use chairs or beds, when, in addition, these people are accustomed to go about bare-foot, we may certainly speak of them as living in close contact with the soil.

In 1348 England was attacked by the great plague, which, appearing first at Bristol and Southampton, spread thence all over the country. Whole districts were depopulated. London and Norwich, being busy and populous centres, suffered especially. Why did the disease spread like a forest fire over the country? Because the hygienic surroundings of the English peasantry at this period were slightly worse than that of the dwellers in Indian cities to-day.

Now let us consider the manner in which the disease spreads in some part of a town during the stage of local place infection, at a time when it is possible to watch the advance of the epidemic step by step. The following is a typical instance. In January, February, and March 1899 there was no indigenous plague in Poona Cantonments, but there had been a good deal in the latter part of that period in Poona City, which is separated from the Cantonments by a long narrow strip of thinly populated ground. There had been several cases of plague, typical and atypical, imported from the city, and these had without doubt deposited the poison in various spots in the Cantonments. We had no means at that time of employing evacuation on any but the smallest scale, but we employed disinfection of houses actually infected. Many of the inhabitants of the Cantonment worked or lived in the Cantonment but kept their families in the adjacent city, and this was especially the case with the *gariwallas*. The condition of the stables in the Cantonments, of which there were a large number, was very bad. The paving of the floors had become worn out; there were no pains taken to see that the fluid portion of the excreta of the animals was conveyed away from the stable itself, but it continually soaked into the soil beneath the stable and the adjacent dwellings; the pipes which were supposed to carry the surface washings from the stable to the nearest uncovered gutter were almost always cracked or broken, so that the line of these pipes below the ground was marked out by the sodden earth above and around them. The ground about the stables was continually moist and smelt of ammonia.

One of the first outbreaks of local place infection concerned a row of six houses on the west side at the south end of a long road known as Main Street. A cross-road broke this row here, and the line of houses on this side of the street was continued by another row. These first six houses were on a slight eminence, and behind them were some court-yards, and behind these a nullah, into which the surface washings of the houses were supposed to run *viâ* the broken under-ground pipes already mentioned. The houses on the opposite (eastern) side of the street were on a slightly lower level. The first indigenous case in the Cantonments was in a *ghariwalla* living above a stable which was the first of the six houses mentioned. When found he had a large suppurating bubo in the right groin, and stated that he had been ill for eight days. The next house was a good one, occupied during the season by a rajah, but then empty. The next house was occupied by the family of a well-to-do Brahmin. On the day following that on which the infected *ghariwalla* was found, there was a suspicious case in the house of this Brahmin. The woman had slight fever for three days, but was able to do her household work. She died one morning after a few hours of incessant vomiting. In the light of subsequent events there was no doubt that it was plague. On the following day a daughter of the first *ghariwalla* died in the segregation camp from acute septicæmic plague. Twenty days after this there was a case of bubonic plague in the house of the same Brahmin. Thirteen days after this a *ghariwalla* living in stables three doors off, and in the same row of houses died from septicæmic plague. He was a fine well-built man who was taken in a dying condition out of his tonga, having been perfectly well when he started out in it; he vomited up some blood, had high fever, and died from heart failure in four hours. So that in thirty-six days the disease had slowly, but surely, passed in a southward direction (and not northward at all) infecting the six houses seriatim, picking out cases from each of the houses which were inhabited at the time, and from families that had not come in contact with one another. Instead, however, of picking up the houses on the same side of the street, but on the other side of the cross-road, it passed obliquely across the Main Street following the slope of the ground, and a young Parsee died in his house from bubonic plague twenty-three days after the death of the last-mentioned *ghariwalla*. On the following day another Parsee, living in the same row as the last, and two houses off, was found to have bubonic plague. The disease then spread behind the eastern side of the Main Street into a collection of hovels in a low-lying area, in which it became generalised, and ultimately fused with another localised epidemic which was spreading up another road running parallel to and on the eastern side of the Main Street.

There are many very well-established facts connected with house infection which I might bring forward in support of my suggestion that plague is a soil infection, but owing to the length to which this paper has unavoidably grown, one must suffice. It is that plague is essentially "the pestilence that walketh in darkness." It is not so much the people who go back to infected houses during the day-time, either to work or to remove property that has been left behind, who contract the disease. But it is those who return to their evacuated houses against orders, in order to sleep the night there and escape the cold nights under canvas, who contract plague. People can return to their shops in evacuated areas for the purpose of carrying on their trade by day, with impunity, so long as they leave them for the health camp before the sun sets; and the explanation of this curious fact, of which many instances could be given, appears to me to be, that when there are several people asleep in a crowded room with every window and door shut, the temperature inside the house rises considerably with the result that the contained air thus rendered lighter, ascends; and hence the relatively heavy cold air external to the house tends to produce a liberation of the ground air into the hot room. This ascent of the ground air would be certainly accompanied by an ascent of minute particulate matter present in the contaminated soil.

The uselessness of the disinfection of the poorer class of native houses when infected with plague has been amply proved by the absence of results, and when one considers the extent and abundance of the bacterial flora in the soil of a native dwelling, this cannot be considered surprising. The mud floor on which the occupants of the house sit or recline at night must be bad enough, and the manner in which it must become infiltrated with animal organic matter in certain quarters and under certain conditions, has been described above; to this add the layer of cowdung with which it is covered; the fact that the interior of many native houses are as dark by day as by night; an excess of carbon dioxide both from the exhalation from the ground, and from the complete absence of ventilation; the rise of the internal temperature from the overcrowding by the inhabitants; the condensation of the vapour from their bodies on the walls and floor; the sputum expectorated by people whose idea of personal hygiene is rudimentary; and, lastly, in plague times the vomit, urine, and evacuations on the ground, and we have all the factors which must produce an intense infection of the soil.

The experiments which have been made in laboratories in this connection are as unsatisfactory and contradictory as most of the work on the ætiology of plague. In India some experiments of a kind have been attempted, mostly negative, but some positive. Inoculation of the dust from infected houses under the skin of guinea-pigs has been followed by the animal's death from plague. But this may have been due to the recent infection of the ground from the sputum or evacuations of a patient. We know that the plague bacillus is remarkable for the manner in which it assumes various forms when grown on different media, and on cultures in the laboratory it rapidly loses its virulence. One can see then the difficulty there would be in demonstrating this particular bacillus in a specimen of soil when it had not only lost most or all of its virulence, but had also altered its shape and staining characteristics In addition to the special difficulties due to the peculiarities of the plague bacillus, there are others due to the fact that in the earth taken from a house in which a large number of people, not at all cleanly in their habits, have been living, a prodigious number of many kinds of bacteria will be present even in a minute sample of such earth. And some of these bacteria are likely to be pathogenic. Hence, if after the inoculation of a guinea-pig with such a sample, the animal dies from tetanus, a thing which has frequently happened, there is no proof that the plague bacillus in one of its many forms was not present as well.

During the height of an epidemic in Hongkong, Yersin found in the soil forming the floor of plague-haunted houses, four or five centimeteres below the surface, a bacterium with all the morphological, staining, and culture properties of the plague bacillus, *but which was devoid of virulence.*

If a bacteriologist takes a specimen of soil and sterlizes it (as he thinks) and then sows it with a culture of plague germs and ultimately finds that these bacilli have disappeared from the soil, his experiment is open to the criticism which has already been applied to others that have tended to produce conclusions which we know to be inaccurate; namely, that he has not reproduced the conditions to which the plague bacillus must be subjected if it is present as a saprophyte in nature These conditions must comprise a certain temperature; a varying amount of animal organic matter; a varying degree of alkalinity; moisture; absence of light; and probably, most important of all, other kinds of bacteria, which will comprise innumerable cocci; fungi (especially such as *mucor mucedo*); many kinds of

nitrifying bacteria; the bacilli of tetanus and malignant œdema; the *bacillus coli* in great abundance and its allies; the *proteus vulgaris*; and many more, named and unnamed, pathogenic and otherwise. Every living thing in nature is acting on in a most complex manner by living things of other species in its immediate environment, sometimes in ways which are almost impossible to follow. We know nothing about the symbiosis of the plague bacillus, except the solitary fact that in animal tissues in the presence of the ordinary micro-organisms of suppuration it rapidly dies out.

The subject is not one which can be dismissed by a few bacteriologists placing pellets of dirt under a guinea-pig's skin. It demands skilled and repeated investigation, carried out with the aid of apparatus to be found in laboratories which in India could be counted on the fingers of one hand.

Should it be ultimately proved, as I venture to think it will be, that the plague bacillus exists as a saprophyte in the soil, it will have the result of impressing on the public, what I urged five years ago (and which only now is beginning to be appreciated by those responsible for the administration of plague-infected towns), that the one and only way of dealing with the problem is partial evacuation carried out on scientific lines, and evacuation of houses rigourously maintained for eight weeks against all and any who refuse to avail themselves of the protection provided them by the Government through inoculation. It will also give an immense assistance to the efforts which the medical profession is making to bring about such sanitary improvements, as will prevent that gross contamination of the soil which appears to be the cause of the persistence of the disease; and, lastly, it will impel every one who deplores the present waste of life and ruin of trade to assist the attempt (recently initiated by Dr. Turner in Bombay) to infuse some elementary notions of personal hygiene among the poorest and least educated classes of the community.

LEPROSY IN THE GARO HILLS, ASSAM.

BY G. G. CROZIER, B.S., M.D.,

Tura, Assam.

So far as known to the writer, nothing special has appeared of late concerning the prevalence and spread of this disease among the Garos (I do not know that it has before been investigated) except two articles in the vernacular monthly published by the mission, and a short article by Revd. M. C. Mason in the *Indian Witness*, October 3rd, 1901, on the transmission of the disease. At the request of the Civil Surgeon here, I have recently prepared a report on the subject for the use of George Penet of London in preparing his paper on the Incidence of Leprosy in the British Empire. I regret not being able to give a more complete and accurate statement of the subject. Much information gained has been through conversation with individual natives and conferences with leading men of the villages concerned, though much has been gained by personal observation and investigation in all the villages where the disease is most common.

Leucoderma is rather common, but is not generally confused with leprosy by the Garos. There is some tendency to conceal the infection, but I find no special difference in this between men and women. Which may be more commonly affected I am not yet prepared to say. There is much truth in the statement in the last Census Report that the statistics are not wholly reliable, but in this district the disease is more common than would be inferred from that Report, though in it there is no special reference to the spread of the disease among the Garos. The census gives 102 lepers for the Garo Hills District, and 649 for the Goalpara District adjoining, in which leprosy is more common than in any other section of Assam. I find but little evidence of the "natural tendency to die out" mentioned in the Report, but, on the contrary, a very strong tendency to spread, though some places do become free from the disease.

The work of this mission station includes the Garos along the edge of the plains in the adjoining district of Goalpara, where there are four large villages with from 50 to 100 or more lepers each. There is but one village up in the hills proper with that number, but in that one village there are as many lepers as the Census Report gives for the entire hills. It has not a single "Christian" in it, contrary to what Mr. Hutchinson would seem to have us believe. They do, however, eat fish, but mainly fresh fish. Practically every Garo in the hills daily eats dried fish and has done so from time immemorial; the villages that are free from the disease as well as the villages where the disease is common, there being as yet no discoverable difference. This village produces large quantities of dried fish that is sold all over the hills as the finest dried fish obtainable by the people. Much is brought up from the plains also, and there is no discrimination so far as possibility of infection is concerned. All unbiased observers must admit that there is a probable danger of infection arising from foods prepared by lepers, but among the Garos, at least, this danger is reduced to a minimum by the long boiling before the fish is eaten. I cannot find that villages that eat most freely of the dried fish from this special village are in any way marked by the prevalence of leprosy. Nor does the Fish Theory account for the exceeding prevalence of the disease in villages along the border in Goalpara, and the practical freedom of other villages living under exactly the same conditions and eating from the same general supply of dried fish prepared by plainsman and sold in the markets where the Garos have purchased their supplies for several generations. Yet there being the possibility of some truth in the theory, it might not be unwise if some sort of Government supervision were exercised over the production and sale of dried fish. Realizing something of the bearing of the subject, one could hardly feel like acting rashly in the matter.

I have the names of seven other villages within the Garo Hills with 10 to 15 lepers each, eight villages with 3 to 6 each, and three villages with 1 to 2 each. Sixteen of these villages are in only one-third of the Garo Hills. I have not yet been able to get such definite information concerning the other two-thirds bordering the greatest leper region of Goalpara. I have, however, toured twice through that region and know the disease to be quite common there also, and it is said to be on the increase. I hope to complete the list next cold season.

In one village where the disease was formerly it is now said to be decreasing, and another is said to have become free from it.

About two or three generations ago a village in the southern section of the hills abandoned their old location because leprosy was very persistent among them. They hoped to escape the evil effects of water or soil or something else peculiar to the place, but there was no relief, so about thirty years ago they gave up their village altogether and scattered to the neighbouring villages. Since then the disease has increased rapidly in those villages, due in part, perhaps to the influx of lepers and in part to the restrictions on their method of limiting the spread of the disease.

The disease is evidently spreading and with considerable rapidity. A year ago I held conferences on leprosy in three of the most leprous villages in the Goalpara District adjoining the Garo Hills, and at the annual meeting of the Garo churches with a carefully selected committee of twenty-three leading men, enquiring particularly as to the present incidence of the disease, and the relative prevalence now and 25 or 30 years ago. I consider the native judgment subject to much error, but still well worth considering. In the largest Garo village, established about 35 years ago, a village of 109 houses, it was the unanimous opinion that the disease was rapidly spreading, and the pastor of the church of 750 members, a thoughtful and keen observer, said: "If you include all those in whom the disease has but recently made its appearance, fully one-eighth of the population of the village are lepers." That would give 100 or more lepers. At another village 20 miles from there the judgment of the conference was that one-fourth to one-third of the people were lepers (giving probably 50 lepers), but that 25 years ago there were only two or three. Later the pastor of another church said his father and two other men were the only lepers in that village 25 or 30 years ago. In a village a few hours' walk from there a similar conference declared that probably three-fourths (or a total of some 120) were leprous. The teacher of another village three miles away, himself and wife lepers, said probably nine-tenths of the people were affected, and that he knew of but three or four sound adults in the village, but that 25 years ago the disease was almost unknown—perhaps 3 or 4 cases he said; now there are considered to be over 130. I visited last November in the centre of the hills the only village in this district proper with a very large percentage of lepers. Although I could not at the time make a thorough investigation, I saw enough to convince me of the substantial truth of the statements of one whose boyhood was spent there, and whose relatives are there now. These statements were corroborated a few days since by a leading man of the village and also by the Laskar living there, also by letter by the man that has served as *mauzidar* in that section over twenty-five years. His statements were that there were not more than two or three lepers when he moved from there twenty-five or thirty years ago, but that now there are not less than 100, practically every home being invaded.

The question most naturally arises, Why this enormous increase? There may be many causes. There certainly is one. Previous to about 30 years ago, while in their independent, wild state, there was most rigid isolation of all lepers in whom the disease was somewhat advanced. Small-pox, syphilis and two other diseases were also kept in check by the same means. Throughout the north side of the hills, the leper was put into a small house at some distance from the village and given his food from the end of a long bamboo. The isolation is said to have been in a measure voluntary on the part of the patient both in the northern and southern portions of the hills. In the south side the leper was usually killed outright after having been made thoroughly drunken. His body was thoroughly scrubbed with ashes and lye, and then he was taken out into the jungle, given a feast of all he could eat and drink; and then was placed on a platform erected over a pit. Ropes were tied round his neck, waist and legs and to a large stone. When all was ready the stone was dropped into the pit and the man strangulated by the tightening rope, and then the body was burned, fuel having previously been arranged under the platform. Government, of course, forbade murder, and a feeling of indifference has grown up, unwarrantedly fostered of late years so far as influence has come from Europeans by the Report of the Leprosy Commission, and now by the equally unfortunate influence of the Hutchinson Theory. Much as there may be of interest and truth in these two pronouncements, the relaxation caused by them is unfortunate.

Present agencies at work to limit or eradicate the disease are as yet ineffective. Government in the four years of my personal observation has apparently done nothing, though even a slight pressure (which would be well borne) would accomplish much and go far towards entirely removing this unnecessary disease from the entire tribe.

Natives well recognize the disease, and by vigorous application of caustics *apparently* cure some cases. I say "well recognize the disease" because I have come to put more confidence in their diagnosis than I did four years ago when I began work among them, though in some things their judgment is most ludicrously wrong. The pastor of one church told me that he had a small area of infection on one thigh that was treated 20 years ago when he was a boy. His father and mother died of the disease. A few weeks ago a teacher said he was treated 11 years ago and knew of one case treated 14 years ago. There has been no return in any of these cases that is apparent as yet. The parents of the teacher are both living free from the disease, though in one of the most leprous villages for 25 years, having moved there in early adult life. One teacher married a leper, and in two years developed the disease on areas that make direct infection seem plausible. Then both were treated by caustics, and one year later the disease had manifested itself again in the man, but not in the woman. The man's history previous to marriage is such as to preclude probability of infection before marriage. One prominent man among the Garos in Government employ told me that while he was an infant his mother was still free from the disease, his father being a leper. Later the mother developed the disease localized on the back, and a child borne after that rather early in child life developed the disease. While this is no proof, it strongly suggests the possibility of infection through contact of the naked child with the bare leprous back of the mother.

It is the aim of the medical mission to the Garos to re-create a wholesome fear of the disease and to educate the people towards the idea of segregation, the employment of only leper teachers in leper villages, no marriage of lepers, and the separate care of children of leprous children. A hopeful fear is plainly returning, and in all villages where I have held conferences the idea of segregation is warmly supported. Two leprous teachers have promised to go and teach in leper villages only, if such are established. Some villages have independently held conferences on the subject. The large leprous village in the hills proper (a pure heathen village) nearly decided to establish separate sections of their village for lepers and non-lepers, but there having previously been no provision made for the children of leper parents agreeable to those concerned, the matter was dropped. Under careful management and with a little pressure from Government, I am confident that it would not be long before practically all lepers could be gathered into leper villages, and their children into homes of their relatives or special homes which could be provided for them. Isolation having been practised by the people from time immemorial to within about one generation, not for this disease only but for four other diseases as well, the idea is much more readily accepted by the heathen and Christian alike.

Although much of the work done during the past four years along this line is far from satisfactory, yet the writer is convinced that leprosy is much more prevalent in this district than was suspected; that it is rapidly spreading and shortening many lives; that its infectious nature is more clearly shown than is currently believed by many; that there is a bare possibility that some early cases are cured, and perhaps rendered immune; and that much can readily be accomplished by segregation properly carried out.

A Mirror of Hospital Practice.

NOTES OF CASES OF PARALYSIS TREATED BY "MASSAGE" IN THE CAMPBELL HOSPITAL.

BY GOPAL CHUNDER MUKERJI,

1st Grade Assistant-Surgeon.

SYSTEMATIC treatment by "Massage" was first introduced into the Campbell Hospital by Lieutenant-Colonel J. H. Tull Walsh, I.M.S., Superintendent of the Institution, from the 24th November 1903. Massage as a therapeutic agent, it appears, has not been tried hitherto in any of the public hospitals in Bengal.

[When I took over charge of the Campbell Hospital in October last, I found a large number of cases of nervous disease, many of which were regarded as incurable. As there is no proper electrical outfit here I suggested careful massage. I have supervised the cases only.—J. H. T. W.]

The methods employed were friction and petrissage, gentle kneading, stroking, slapping and joint movements. Camphorated mustard oil was used in many instances as a lubricant and was found to be a valuable adjunct.

3. The subjoined *précis* of cases treated by massage *only* will show how quickly, in some instances, the paralysed muscles regained their power, and increased in bulk. It was remarkable that the sensory disorders in locomotor ataxy were also amenable to treatment by massage. Almost in every case the patients experienced a comfortable subjective feeling and a sense of lightness after massage. It has not been thought necessary to enter into any detail concerning the way in which *massage* acts, as the notes themselves form a long paper. The principle of *massage* is simple, but if it is to do good it must be applied intelligently and for long periods.

Précis of Cases of Nervous Diseases treated by Massage in the Campbell Hospital.

No.	Name.	Age.	Sex.	Caste.	Occupation.	Disease.	Duration of disease.	Short previous history.	Condition before treatment by massage.	Date of commencement of massage.	Effects of massage.	REMARKS.
1	Kailash	40 yrs.	Male	Hindu, Benia.	Beggar.	Spastic paraplegia.	10 yrs.	History of syphilis.	Muscles of the lower limbs rigid, could walk with the help of a stick with difficulty.	13-2-04. 24-11-03	Rigidity disappeared gradually after massage, could walk easily without the help of a stick, girth of limbs increased by ½ inch.	Here too much credit must not be given to massage as the *syphilis* was treated by drugs. *Massage* here assumes its simplest rôle, that of helping nutrition.
2	Gopal	60 ,,	,,	Hindu, Tanti.	Coachman.	Hemiplegia, left.	3 ,,	History of alcoholism and unconsciousness after a fall from coach box.	Muscles of the left upper and lower limbs rigid and atrophied, knee-joint rigidly flexed, left forearm rigidly flexed on the arm, wrist rigidly flexed, partial anæsthesia, could walk with extreme difficulty with stick, keeping legs rigidly flexed.	2-4-04. 4-2-04	Rigidity markedly decreased, could extend the leg more freely and raise the arm at an obtuse angle and extend the forearm, close fist and move fingers, cutaneous sensation returned, could walk with support more easily and extend the leg without help. Limbs increased in girth by about an inch.	.....
3	Ridhoy Kristo Pal.	50 ,,	,,	Hindu, Benia.	Fruit-dealer.	Hemiplegia, right.	10 ,,	History of syphilis, gonorrhœa, alcoholism and unconscinousness after fall.	Muscles rigid and atrophied, right leg flexed and also the right forearm.	2-4-04. 7-3-04	Can extend forearm and arm, move fingers, and grasp things, extend the leg at an obtuse angle, measurement of limbs increased by ½ inch.	.....
4	Natabor	40 ,,	,,	Hindu, Kaisthya.	Cultivator.	Hemiplegia, left.	2 ,,	History of syphilis, gonorrhœa and alcoholism and fall from a height.	Could walk with difficulty with the help of a stick, muscles of the left limbs rigid and atrophied, joints stiff, arm adducted, forearm flexed, hand flexed and pronated, fingers semiflexed.	2-4-04. 24-11-03	Rigidity of muscles remarkably less, extension of limbs more easy, can raise left upper limb at an obtuse angle with the trunk, move fingers, walk more freely and quickly, calf muscles increased in girth by about ½ inch.	.....

									6-2-04.	
5	Kailash De	50	,,	,,	,,	,,	Paraplegia (ataxic).	1 yr.	History of syphilis, gonorrhœa and alcoholism.	Great weakness of the lower limbs with unsteadiness and rigidity, difficulty in walking even with support, dull aching pain after exertion.	24-11-03	Could extend limbs with more ease, rigidity almost absent, could walk without support, no pain after walking, calves increased in girth by ½ inch and thighs by a little over an inch.	This case illustrates the value of *massage* in relieving pain.
									23-1-04.	
6	Jagat Chandra Shing.	40	,,	,,	Hindu, Chetri.	Plumber.	Ditto	... 4 mos.	History of syphilis, gonorrhœa and alcoholism and exposure to cold.	Gait unsteady, marked in-co-ordination in walking, could not walk without the help of a stick, aching pain in the legs.	2-1-04	Could walk with the help of a stick, unsteadiness remarkably diminished, *pain disappeared*, calves and thighs increased in girth by ½ inch.	.....
									6-2-04.	
7	Hormodhan	30	,,	,,	Mussulman, Sheik.	Cart-driver.	Hemiplegia, right.	2 yrs.	History of alcoholism and ganja-smoking.	Could not walk at all, muscles of the right upper and lower limbs rigid and atrophied.	26-11-03	Could walk with the help of a stick, rigidity of muscles markedly less, could grasp the stick with the right hand which had been paralysed, girth of the limbs increased by ¼ inch.	.....
									2-4-04.	
8	Baisnab Charan	29	,,	,,	Hindu, Koiborta.	Beggar.	Paraplegia	... 6 ,,	History of fall from a height.	Muscles of the lower limbs rigid and atrophied, patient confined to bed, could not move his lower limbs.	24-11-03	Could get down from his bed unaided and stand up with the help of a support and move his legs; girth of lower limbs increased by a little over an inch.	This case is one worthy of note, showing that good may be done even in old cases with care and perseverance for over 4 months.
									2-4-04.	
9	Lal Mohamad	35	,,	,,	Mussulman, Sheik.	Shopkeeper.	Hemiplegia, right.	4 yrs.	History of syphilis and sexual excess.	Right hand and forearm rigidly flexed and the arm rigidly adducted to the side; attempt to extend the upper limb produced pain, right foot dropped, ankle and knee-joints fixed by muscular rigidity, atrophy of muscles.	24-11-03	Could extend the upper limb freely and walk with the help of a stick; girth of the limbs increased by ¼ inch.	.....

Précis of cases of nervous diseases treated by Massage in the Campbell Hospital.—(contd.)

No.	Name.	Age.	Sex.	Caste.	Occupation.	Disease.	Duration of disease.	Short previous history.	Condition before treatment by massage.	Date of commencement of massage.	Effects of massage	REMARKS.
10	Hari	50 yrs.	Male	Hindu, Kaisthya.	Grocer	Locomotor, ataxy.	3 yrs.	History of syphilis, gonorrhœa and alcoholism.	Sensation of pins and needles and lightning pains and girdle pain, unsteadiness of gait, inco-ordination of muscles and difficulty of micturition, patient almost confined to bed.	24-11-03	2-4-04. Almost complete freedom from sensation of pins and needles and lightning pain, sleep undisturbed, girdle pain less, no difficulty in micturition, could walk about with the help of a stick, calf muscles increased in girth by about ½ inch.	In this, as in other cases, treatment by drugs was continued, but drugs previously had but little effect until assisted by the physiological results of massage.
11	Munshi Ali	45 ,,	,,	Musulman, Sheik.	Khalasi	Hemiplegia left.	5 mos.	History of syphilis and fall from a height.	Muscles of the left limbs rigid and contracted, could not walk or hold anything by the hand.	26-12-03	2-4-04. Rigidity disappeared, could extend the limbs easily and walk about with the help of a stick, legs increased in girth by about ½ inch.	.....
12	Kulgiri	40 ,,	,,	Hindu, Koiborta.	Coolie	Hemiplegia, right.	3 yrs.	History of syphilis.	Muscles rigid, right forearm and hand semiflexed, could not extend the lower limb or walk without the help of a stick.	26-12-03	2-4-04. Could walk easily without the help of a stick and extend the right upper limb, and hold objects with the right hand; girth of limbs increased by about ½ inch.	.....
13	Bepin	45 ,,	,,	Hindu, Koiborta.	Milk-seller.	Spastic paraplegia.	3 ,,	History of syphilis and gonorrhœa.	Marked rigidity of the muscles with spastic gait, could not walk without the help of a stick, soon getting tired.	24-11-03	18-3-04. Remained free from rigidity of the limbs and could walk with the nominal help of a stick for about an hour after massage.	.....
14	Ram Beshun	40 ,,	,,	Hindu, Jhunbri.	Cultivator.	Paraplegia	3 ,,	History of syphilis and alcoholism.	Tingling pain in the lower limbs, could not walk without the help of a stick, muscles flaccid.	20-2-04	2-4-04. Pain diminished, disappearing altogether for about 5 hours after massage, could walk more easily, left leg and right thigh increased in girth by a little over ½ inch, muscular tone improved.	.....

										26-3-04.	
15	Manna Lal	55	,,	,,	Hindu, Brahmin.	Beggar	Locomotor ataxy.	6 mos.	History of syphilis.	Girdle pain and tingling sensation, inco-ordination of muscles and unsteadiness of gait.	18-2-04	Muscles gained tone, and girth of limbs increased by ½ inch, tingling sensation disappeared after massage.	.....
										21-3-04.	
16	Shadhoo	30	,,	,,	Hindu, Koiborta.	Day labourer.	Hemiplegia, left.	1 yr.	History of fall from a tree and unconsciousness.	Slight rigidity and atrophy of the left upper and lower extremities, could not walk without the help of a stick.	5-2-04	Rigidity disappeared, could raise the left arm more freely and could walk without the help of a stick; girth of the left forearm increased by ½ inch.	.....
										2-4-04.	
17	Dinonath	60	,,	,,	Hindu, Baisnab.	Clerk	Ditto	2½ yrs.	History of syphilis, alcoholism and sudden unconsciousness.	Muscles of the left upper and lower limbs rigid and atrophied, complete loss of voluntary movement, could walk with the help of a stick with difficulty.	8-12-03	Could extend the arm more freely and walk more easily, rigidity disappearing after massage, measurement of the left arm increased by ⅛ inch.	.....
										2-4-04.	
18	Babu Lal Shing.	48	,,	,,	Hindu, Brahmin.	Beggar	Spastic paraplegia.	4 ,,	History of syphilis, alcoholism and ganja-smoking.	Inability to stand or walk even with a stick or with the help of others, legs are rigidly flexed.	13-2-04	Could extend his legs more freely, remained free from rigidity for some time after massage; measurements of the calves increased by ½ inch.	.....
										2-4-04.	
19	Ram Charan	52	,,	,,	Hindu, Gala.	Coolie	Ditto	16 ,,	History of syphilis, gonorrhœa and alcoholism.	Could walk with difficulty with the help of a stick, legs rigidly extended and adducted, fatigue on slight exertion.	24-11-03	Rigidity less, could walk more easily after *massage*, girth of limbs increased by ½ inch.	.....
										2-4-04.	
20	Hari Das	60	,,	,,	Hindu, Koiborta.	Ghar-ami.	Ditto	2½ ,,	History of syphilis and gonorrhœa.	Could not stand up, legs semiflexed and rigid.	1-1-04	Rigidity less after *massage*, could extend legs and walk with the help of a stick, girth of calves increased by ½ inch.	.....

CASE OF DISTOMA CRASSUM OR BUSKI.

By P. S. WOOD, M.B., C.M.,

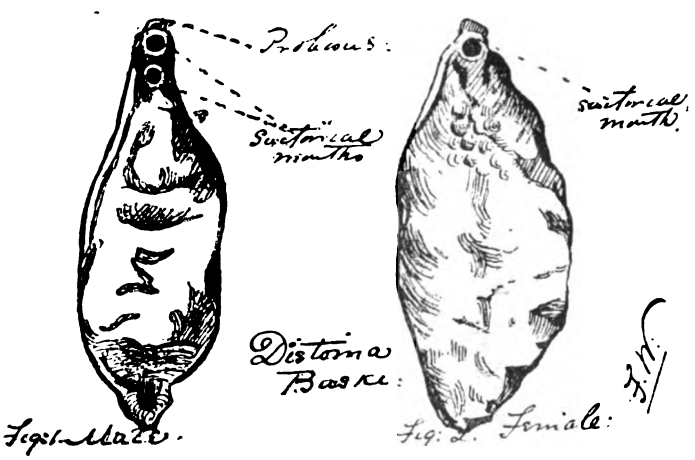
MAJOR, I.M.S.,

Superintendent of Jail, Sylhet, Assam.

As this fluke is one of the rarer parasites inhabiting the intestine of man, a description of it might be of intersest. Reviewing the literature on the subject at my disposal, I find that only two cases have been reported from Assam—one by Dr. Sinclair of Selangor in 1889 and the other by Dr. Giles. The parasite seems to be fairly common in China.

Case.—Convict Junab Ali was received from the subjail of Sunamganj on the 5th December 1903, apparently in good health. On the 8th April 1904 he was attacked with dysentery, was treated with the ordinary medicines and was discharged cured; but as he was weak, was put into the convalescent gang on the 12th April 1904. About three or four days after this he got diarrhœa and his condition on re-admission was as follows:—

Anæmic, tongue pale and flaby, shewing slight pigmentation at the edges; the conjunctivæ have a yellowish colour, ankles are slightly œdematous, and he complains of burning in the palms and the soles of his feet. In spite of astringents the diarrhœa did not stop, and he had five or six stools daily not containing blood, but yellowish in colour and containing mucus. Suspecting the presence of ankylostomes, he was given on the 3rd May 1904, two 10-grain doses of Beta Napthol; the next morning he passed two specimens of Distoma Crassum and 30 ankylostomes: after passing these worms, the diarrhœa stopped and he made rapid progress. Of course in this case the symptoms may have been due to the presence of the smaller parasites, but I cannot help thinking that the two large flukes were the chief factors.



Description of the Flukes.—Both were somewhat fleshy, of a dull greyish yellow colour, the surface being marked with fine reticulated lines. When first passed they shewed sluggish movements, especially of the anterior pointed proboscis or snout. One was much thicker and broader than the other—evidently the female; and in this one only one opening suctional mouth could be seen anteriorly. The intestinal cæca of both did not ramify. The smaller fluke was two inches long and one inch in breadth. The larger two inches long, but 1 inch in breadth.

Dr. Bentley's anthelmintic Beta Napthol may be of great use when the presence of this parasite is suspected; in this case two doses certainly did a great deal of good. A drawing of the two parasites passed is given: they were made after immersion in spirit, so that they are smaller than before, but they give a very good idea of the appearance of the worm.

A RARE CONGENITAL DEFORMITY OF THE EYES.

BY T. E. DYSON,

MAJOR, I.M.S.,

Actg. Ophthalmic Surgeon, Bombay.

THE patient, a fine healthy male child of four months, shewing no other obvious deformity, was brought to hospital in February last, with the malformation of the eyes, which is shewn in the accompanying photograph.

The eyelids, upper and lower, and eyelashes are normal but small, while the conjunctival sac is represented by a shallow depression, covered by normal conjunctival membrane.

Situated in the cheeks, immediately below these rudimentary eye sockets, are two symmetrical tumours of the size and appearance of eyeballs, but possessing neither sight nor movement.

They are covered with the skin of the cheeks, which appears to be thinned at these points and are soft and pulpy to the touch; while just beneath them can be felt the lower bony margins of the orbits.

I could not promise any sight after operation and the mother objected to any exploratory incisions.

THE

Indian Medical Gazette.

JULY, 1904.

THE ANTIMALARIAL OPERATIONS AT MIAN MIR, 1901-03.

WE call the attention of our readers to the very complete and valuable second report on the antimalarial operations at Mian Mir in the year 1901 to 1903, just published by the Sanitary Commissioner with the Government of India. The first report on the operations at Mian Mir was published, as No. 6 (new series) of the *Scientific Memoirs*, in 1903, and was written by Captain S. P. James, I.M.S. The present report *Scientific Memoirs* (No. 9) is written by Lieutenant S. R. Christophers, I.M.S., who supervised and conducted the antimalarial campaign during 1903.

The report is a record of a very thorough attempt to grapple with malaria in one of the most unhealthy cantonments in India. The results can hardly be called satisfactory as regards the extermination of malaria or of the mosquito; but they well illustrate the difficulties that lie before us in this branch of hygiene. The report also makes one feel somewhat sceptical of the results so widely proclaimed of the working of similar antimalarial operations in other places. We must not, however, expect to achieve success in the first attempt. The special conditions of canal irrigation at Mian Mir are a primary difficulty, but even more so are the conditions of the soil, which render it impossible to get rid of rain-water, which consequently lodges in all inequalities of the ground.

We cannot here follow Lieutenant Christophers in his interesting, indeed fascinating, account of his antimalarial measures. The Sanitary Commissioner has wisely decided to sell these Memoirs at nominal cost, and we are certain that no one who has paid ten annas for this report will ever regret it.*

We may, however, quote the conclusions with which the report is summed up:—

"We may tabulate what has been demonstrated in the Mian Mir operations as follows:—

(1) The destruction of *anopheles* within an area, by attacking their breeding grounds, is exceedingly difficult. Although large number of pools were filled up and drained and millions of larvæ destroyed by oil, adult anopheles were still abundant.

(2) The mere obliteration of local breeding places is useless. In Mian Mir almost complete absence of breeding was ensured to a distance of over half a mile, but adults still appeared in large and increasing numbers in the area.

(3) A distinct effect was produced upon the malaria of troops and on the endemic index of the bazaars. This was, however, only evident in the beginning of the fever season, and could not be maintained.

(4) The failure of the operations appeared to be due to the passage of adult anopheles from without. This went on steadily during October when breeding places were not present in the area, and it could not be prevented.

(5) The value of quinine administration was found to depend entirely upon the degree of supervision exercised. Experiments showed that where men took quinine regularly the admission-rate for fever was much reduced.

(6) The operations further demonstrated the necessity of removing bazaars and followers' lines to a distance. Experiments undertaken with a view to rendering small collections of native followers innocuous by treating the children with quinine was very successful. Where small native communities, especially servants' quarters, cannot well be removed, the regular administration of quinine to children is a prophylactic measure of no small value."

"It is significant" (continues Lieutenant Christophers) "that some effect upon malaria was produced by antimosquito measures, but, as regards Mian Mir, it is evident that the operations undertaken were unable to effectively control the incidence of malaria among the troops. It is our opinion that, although the operations yielded a great deal of information and showed what difficulties must be taken into account, they were not those best adapted to the eventual reduction of malaria The latter we believe to be such gradually carried out reforms directed against malaria as are indicated by careful investigation into the conditions present in cantonments. At Mian Mir, for instance, there are several features which can be unhesitatingly denounced as tending to foster malaria. These cannot be removed at once, but their gradual removal is, in most cases, we believe, possible. In the experiments efforts were made to obtain immediate results, and the permanent removal of widespread insanitary conditions was not attempted. It is possible that the conditions in Mian Mir were more difficult of control than in some other cantonments .....With regard to quinine administration, we think the difficulty of maintaining efficient administration will prevent this measure from being of much use as a routine one. Moreover, it appears to us that gradual but permanent improvement in the health of stations, by well-directed sanitary reforms, wherever these can be carried out, will, in the end, yield the best return"

* The *Scientific Memoirs* are obtainable, as soon as published, from Messrs. Thacker, Spink & Co., Calcutta.

LONDON LETTER.

MISSING FORCEPS.

A CORONER'S inquest was lately held in London regarding an abdominal operation performed by

Mr. Stephen Paget in the West London Hospital. The patient, a female, was in urgent need of relief, on account of intra-peritoneal hæmorrhage; her condition was critical, the call for operation sudden, and the necessity for rapidity of execution imperative. Death was averted, but the temperature subsequently remaining high and other symptoms causing anxiety arising, a second operation was performed by another surgeon and a forceps was found in the interior of the abdominal cavity by him which had been used during the first operation and had caused perforation of the bowel. The case proved fatal; hence the inquest. This unfortunate incident is by no means an unprecedented one. Many surgeons, including men of great skill, high reputation, and undoubted capacity, have inadvertently left in the peritoneal cavity instruments, sponges and even towels, which have sometime been subsequently removed with success, but perhaps more frequently discovered at *post-mortem* examinations. The circumstances of these operations are often such as to render misadventures of this sort very possible, but they are always painful, if not discreditable, and in view of such experiences too much care cannot be taken in counting and accounting for all instruments and appliances employed in performing abdominal operations. This was the view taken by the jury in the present instance and it is undoubtedly sound. At the same time sympathy must be felt for Mr. Paget in circumstances which must have given himself more pain than any one else.

AN X-RAY CASE.

A curious case has recently been tried in a London Court. A medical man sued a patient for fees on account of services rendered to his wife, who was afflicted with internal cancer. The husband brought a counter-charge for assault. It appears that the medical man in question made a speciality of treating cancer by X-rays and high frequency currents and made known his methods and results. These attracted the attention of the husband who had resorted to other methods of treatment in vain. He took advice on the subject from Sir Victor Horsley and other distinguished surgeons, who pronounced against the X-ray treatment, but did not condemn frequency currents so decidedly. Accordingly the patient was placed under the specialist's charge for trial of the latter. It appeared that he saw fit to use X-rays, which caused severe burns. The husband contended that these were employed without his knowledge and consent, and the jury took this view and disallowed the specialist's claim on that ground. The treatment of cancer, internal or even external, by such methods is of very questionable utility, and although a medical man is quite justified in making trial of them, if this can be done without pain or injury, he is certainly not justified in vaunting their curative power or inflicting suffering or damage in their application.

INTRAVENOUS INJECTIONS OF IODOFORM IN PHTHISIS.

Some years ago—in 1900—Dr. Robert Macguire of the Brompton Consumption Hospital described in a Harveian lecture certain experiments which he had made for the purpose of introducing germicides into the lungs through the venous system, with a view to the destruction of the tubercle bacillus. Previously various trials had been made of various agencies employed in various ways to this end. "Consumptives worked hard with inhalers of sorts when awake, and thus slept in an atmosphere loaded with volatile antiseptics in the night. They swallowed bacterial poisons, they absorbed them by application to the skin, by injection under the skin, by deep injections into the lungs, by inflation of the rectum with gaseous germicides and by intratracheal injection of suitable antiseptic preparations:" all without benefit. Dr. Macguire selected formic aldehyde as his bactericide, and after some experiments on animals to ascertain the safety of the procedure he introduced a solution 1 in 2,000, in doses of 50 cc. into the veins. He asserted that the cases in which this plan was resorted to underwent great improvement. "All of them showed improvement in the physical signs, diminution of the amount of expectoration and decrease of fever, while a few demonstrated the disappearance of tubercle bacilli from the sputum." Since the publication of this lecture no further evidence regarding the value of this method has been supplied either by Dr. Macguire or others. Quite recently a pamphlet has been circulated by Dr. Thomas, W. Dewar of Dunblane, N.B., a reprint of an article which appeared in the *British Medical Journal* of 21st November 1903, which advocates the intravenous injection of a solution of iodoform in ether in phthisis. The strength used is 1 to 7, and the dose m. v to vii, frequently repeated.

The materials must be absolutely pure, the skin and instruments scrupulously sterilized and the injection made slowly, In one case about one hundred injections were made. Dr. Dewar had not had a large experience of this method; but he had had no mishap and asserts that the cases which he has treated by it have undergone marked improvement—some notwithstanding very unfavourable hygienic surroundings. Whether this suggestion will take better than Dr. Macguire's remains to be seen but one inclines to doubt whether the cure of phthisis will, if ever, be achieved on these lines. Meantime the sanatorium system holds sway and probably preventive measures give better hope of exorcising the white fiend than curative—whether regimenal, dietetic or medicinal.

THE LATE SIR HENRY THOMPSON, BART.

The death of this distinguished surgeon took place at the age of 84, on the 18th of April. He was—in addition to being a great authority on stone and surgical diseases of the urinary organs generally—a man of various gifts and successful in many departments of literature and art. He possessed great powers of application, a very active and productive mind, and was also a conspicuous social success. One of his pet hobbies was cremation, and he was largely instrumental in establishing the practice which is now frequently resorted to in this country.

He left a considerable fortune, amounting to over £226,000. The Association of Urinary Surgery and Novel Writing does not appear to be a very natural one—certainly it is not a very usual conjunction; yet such were the width and elasticity of Sir Henry Thompson's genius that he excelled in both. We are apt to think, as great gifted conspicuous members of our profession leave the stage that their place will remain void; but the medical profession will never lack able and talented representatives and assuredly never in the history of the world did the profession, as a whole, occupy the same high level of attainment, skill and devotion as it does at the present time.

The 19th May, 1904. K. McL.

Current Topics.

PATENT MEDICINES.

THERE are few medical men in India who have not met with instances where there was a serious abuse of the use of patent medicines. We may therefore follow Dr. Hutchison in his second lecture on Patent Medicines.

We need not however follow the learned subtlety of Mr. Justice Wills, who recently laid down that remedies which are recommended for the cure of any particular ailment are taxable, *i.e.*, have to pay a stamp duty; on the other hand, such a mixture as soothing syrup is exempt from duty, because it does not, perhaps wisely, specify what it is intended to sooth.

We will therefore only quote from Dr. Hutchison's valuable lecture his statements as to the ingredients of several very popular and well-known "proprietary preparations." Beecham's pills, now advertised in all languages in our Indian railway stations, consist of soap, aloes and ginger. Carter's Little Liver Pills contain podophyllin ($\frac{1}{8}$ grain) and aloes soc. $\frac{1}{8}$ grain in each pill. Holloway's Pills are made of aloes, rhubarb, saffron, Glauber's salts, and pepper. Enos' fruit salt consists of bicarbonate of soda, tartaric and citric acid. Abbey's salt and Lamplough's pyretic saline are very similar. Keating's cough lozenges are made of ipecacuanha, squills, lactucaria, liquorice and sugar; in two preparations for gout colchicum is the active ingredient.

Antikamnia consists of bicarbonate of sodium, antifebrin and probably caffein. Bunter's Nervine is made up of creosote, chloroform, camphor, tolu and alcohol. Mrs. Allen's Hair Restorer consists of acetate of lead, milk of sulphur, scented with oil of cinnamon. Tacho, it is well known, is made of purified oil of paraffin and oil of lemon. Koko is merely borax, glycerin and rosewater. The remedies for obesity are many, among them we find Trilene Tablets to consist of sugar and an unknown vegetable constituent, Russell's "Cure" is citric acid (40 gr. to 1 oz.) glycerin and water. Californian Syrup of Figs is senna, figs and cinnamon, the active ingredient being senna. Doane's backache pills are oil of juniper and a resinous constituent like copaiba. Guy's tonic is no more than phosphoric acid, cochineal, gentian, and chloroform water. The active constituent of Clarke's "Blood Mixture" is iodide of potash. "Pink Pills" consist of sulphate of iron, liquorice and an alkaline carbonate, coloured with carmine. Seigel's syrup contains aloes, capsicum, treacle and liquorice. Warner's "Safe Cure" is nitrate of potash (10 gr. to 1 oz.) and various diuretic herbs. Antidipso is chlorate of potash and sugar.

It will be admitted that in most of the above preparations the activity is largely due to some aperient substance, and certainly many of them are elegant examples of pharmacy.

Why then, as these preparations contain nothing new, and nothing mysterious, are they so popular that the revenue from the stamp duty on their sale amounts to no less than £300,000? Dr. Hutchison thinks this is partly due to the

existence of a large amount of minor ailments, which people do not consider it worth consulting a medical man about, but there is more, there is a subtle physiological reason for their success. None of us like to confess to failure in the treatment of a case, and this is specially true of the man who tries to cure himself. The man who buys a bottle of patent medicine becomes his own physician, and if he gets well he thinks much of himself and tells his friends what a clever fellow he is. Hence the successes are talked about and the failures buried in obscurity.

THE ETIOLOGY OF SCURVY.

THERE was a time when the etiology of scurvy seemed to be quite settled, but of recent years the tendency has been to upset our old views, both on the etiology and the pathology of this disease.

As to the commonness of scurvy, if we are to judge by the actual number of persons admitted to hospital in India for this disease, we would say it was rare, *e. g.*, in the year 1902 there were only ten admissions in the British Army in India, 302 admissions in the Native Army and only 145 in all the prisons of India, and the Sanitary Commissioner, with the Government of India states that the "opinion is gaining ground on all sides that the essential factor in its causation is the absence of *fresh* animal or vegetable food." It will be remembered that scurvy was attributed in the Jackson Polar Expedition to bad tinned meats, and Nansen's experience has shown that fresh meat of bear or walrus will certainly keep away scurvy. The most recent paper on this subject we have seen is one by Dr. Myer Coplans, read at the Epidemiological Society in February last, and based upon his experiences as a Civil Surgeon attached to the troops in the late South African War. He found what he regarded as scurvy in the Burgher Concentration Camps among European soldiers and among Native Africans attached to various corps and departments. Among the native followers there was a most striking contrast between what was called the Native Labour Corps and the Native Sanitary Corps. They received *the same diet*, viz., maize meal 2¼lb. daily and 1lb. meat weekly. The Labour Corps had only 16 per cent. affected with scurvy, while the Sanitary Corps (or as we would call them in India the "sweepers") had no less than 76 per cent. affected. This points, says Dr. Coplans, to a factor other than food as the prime cause of the disease. Lime juice was issued but seldom taken, it was not mixed with sugar and was altogether too acrid, and too raw to be relished.

We may quote Dr. Coplans' accurate description of the gum affection.

"Further evidence against food being the prime cause of the condition is afforded by clinical study of the cases—more especially by consideration of the mode of onset and the results of treatment. All these cases of scurvy commenced as an inflammation of the gums, and the general symptoms followed at varying intervals, but always secondarily to the gum condition.

"Improvement or the reverse followed *pari passu* with improvement or aggravation of the gum condition. This inflammation of the gums occurred in all cases, without exception, and in a definite manner. The process was as follows: Around the tooth and next to the gum was first noticed a collection of food. The gum-edge nearest this aggregation soon became of a deeper red tint. This deeper tinted area spread rapidly, but in the early stage was always separated from the healthy gum by a definite violet-mauve demarcation line In a few days the whole of the gums, both internally and externally, became involved in the inflammatory process, and areas devoid of teeth which had hitherto been healthy were now affected. At this stage, the affected tissues were deep red in colour, soft, swollen and compressible, tender, and bled easily on pressure. In a day or so the gums became easily separable from the teeth; and deep down, between the gums and the teeth, definite masses of a cream-cheesy consistency and colour could be seen and removed. These masses, on microscopic examination, were found to consist of pus cells, numerous micro-organisms of various kinds, and food *débris*. At this stage there were no constitutional symptoms, nor could any changes be detected in the cardio-vascular system. These conditions developed later at varying intervals, and it was found that they did not develop when means were adopted to remove the gum condition. Moreover, in cases in which the general disturbance was present, there could be no ultimate recovery without a prior return of the gum condition to the normal. The method of treatment adopted, therefore, consisted of rest in the open air, isolation from previous surroundings, coupled with rigorous and frequent mouth antisepsis, care being taken to remove the cheesy masses mentioned above The rate of general improvement and return of the gums to the normal condition was in direct proportion to the amount and efficiency of the antiseptic treatment employed for the mouth.

"The fact that these cases when seen early could be completely cured by this treatment alone—with, be it noted, no alteration of any sort in the diet—argues directly against the diet being the prime cause of the condition. Further, the value of local treatment for the mouth condition is emphasised by a comparison of the results of treatment in advanced cases by (1) local *plus* constitutional treatment, and (2) by constitutional treatment alone. For local *plus* constitutional treatment the average length of residence in hospital was from twenty to thirty days; but from constitutional treatment alone from sixty to ninety days. It is also interesting to note that in advanced cases in which mouth antisepsis was employed there was little or no pyrexia, but that periods of pyrexia were a feature of similar cases in which this treatment was omitted.

"These clinical facts, therefore, seem to suggest that the condition is not due to the food, but is one caused by an infection through the gums and mouth. Whether the system is infected directly through the gums or through the swallowed saliva after the gum condition has developed cannot be readily determined. . . . .

"In conclusion, gentlemen, I submit that the facts adduced seem to prove that scurvy is not due to either the presence or absence of any particular kind of food but rather to an infection for which food may act as a vehicle under conditions of dirty storage or dirty preparation; and, considering that the disease prevailed in inverse proportion to the standard of personal hygiene of the individuals affected, its infectivity would seem to depend on the insanitary habits and perhaps the unwholesome occupation of those who were its victims."

It will be noted that in the above description no mention is made of any general symptoms

such as swellings in the limbs, &c. Now it is a remarkable fact that in the scurvy, so called, as seen in Bengal Jails there is seldom or never any affection of the limbs, the so-called scurvy is limited usually to the teeth and gums, and in our own personal experience gallons of lime juice and *gur*, administered daily to gangs before our own eyes, have been quite useless. This opens up the question whether we are justified in calling every case of spongy gums, such as are graphically described above by Dr. Coplans, scurvy, or whether there may not be a local infection, which may be called pyorrhœa alveolaris or stomatitis. In any case whether among troops or prisoners the condition is a serious one, and certainly in our experience care and attention to cleaning the teeth is one good means of largely limiting the spread and seriousness of this affection. Since the above was written, we have received the communication on scurvy among the troops in Somaliland from Lieutenant Fleming Barnardo, I.M.S., which we publish above. It shows the great importance of the disease, and is a valuable contribution to the pathology of the blood in this disease. We would much welcome a study of this kind of the "scorbutic symptoms" found at times among prisoners in jails. As regards therapeutics or prevention, nothing seems to be of such paramount importance, as *fresh* food, fresh meat or fresh milk.

THE REVACCINATION QUESTION.

THE *Lancet* (23rd April 1904) seeks, in a leading article on the isolation of small-pox in Germany, to demonstrate that the immunity which is enjoyed by the inhabitants of the Fatherland is not, as has been alleged by the opponents of vaccination, to be ascribed to the isolation and segregation measures which are practised there, but to the strict system of compulsory vaccination and revaccination which obtains.

The burden of proof lies in the results of enquiries—made by Dr. Robert Bruce Low at the instance of Mr. Walter Long—published in an interesting report upon the suppressive and preventive measures in force in ten of the provincial towns in Germany, *viz.*, Berlin, Cologne, Frankfort-on-Maine, Wiesbaden, Mayence, Munich, Nuremberg, Dresden, Leipsic, and Stuttgart.

It would appear that the importance attached to isolation and segregation is entirely secondary; in nearly every town the pavilion used is part of the general hospital, and, in many instances, is not separated from the pavilion used for the isolation of other infectious diseases. In some places, no special accommodation whatever exists, but, when a case occurs, the patients are removed from one of the pavilions and the cases isolated therein. Small-pox patients are generally supplied with food from the general kitchen, and their soiled linen is sent, after disinfection, to the common laundry.

When cases are isolated at the general hospitals no panic occurs, and there is no incidence of the disease upon the surrounding population; the attendants of the infected are again revaccinated, but with the remaining staff and other patients, reliance is placed upon the general and routine vaccination and revaccination of the people.

"How different," writes the *Lancet*, "is all this from the conditions which obtain in this country (Britain), with its repeated instances of the excessive incidence of small-pox upon the houses in the neighbourhood of the small-pox hospitals and the costly machinery necessary to obviate such occurrences. And yet, few, if any, persons, conversant with the history of small-pox in London and of the influence of the small-pox hospitals, would venture to suggest that with our present very imperfect protection by primary vaccination alone London should again 'isolate' its cases within its own limits."

There can, therefore, be no doubt that the immunity enjoyed by the Germans is not the outcome of any other measure than the removal of subjective predisposition, in the absence of which, external predisposing causes and the infective agent (be the latter vital or chemical) are powerless.

Even with partial removal of such predisposition by primary vaccination the epidemic character of small-pox has been entirely changed in England. According to Whitelegge the "bills of mortality" show that upon the average 7 to 9 per cent. of the persons buried in London during the 17th and 18th centuries had died of small-pox, and, in epidemic years, the proportion often rose to 13, 15 or even 18 per cent. The only approach to this state of things since the introduction of vaccination was in the pandemic year of 1871 when 9·8 per cent. of the deaths were due to small-pox; the general mortality upon which this percentage was based being, of course, far smaller in proportion to the population than in the previous century. Since 1885 London has become almost free, the death-rate from this cause for four consecutive years being 0·002 or less.

Other English towns have also been unprecedentedly free during the past few years, but there have been indications of reviving activity since 1891 in some parts, more especially in the manufacturing districts of Yorkshire, Lancashire and Gloucestershire; and, unless recourse be had to compulsory revaccination, which renews the immunity temporarily conferred by primary vaccination, there is every reason to expect a return of epidemic prevalence.

After the pandemic of 1870—1874 revaccination was made compulsory in Germany only, and there has not been a return there of the disease in epidemic form since. A recent official analysis of the causes of death, in those who died among over thirty millions in Germany within a few weeks or months of vaccination or

revaccination (vide *British Medical Journal*, 16th April 1904) showed that in just over two cases per million could death be in some way attributed to the operation. It might thus be said that in place of tens of thousands of children who formerly died annually in Germany from small-pox, less than ten die now in consequence of unfavourable circumstances occurring accidentally after vaccination or revaccination. This is a significant fact for the party politician and conscientious objector, and for the class, generally, who cannot or will not see that even compulsory school attendance involves far more serious risks than compulsory vaccination.

The Imperial Vaccination League has issued a list of those who have signed the declaration in favour of the Revaccination Bill now before the House of Commons (*British Medical Journal*, 30th April 1904). The list, which takes up seventy-eight pages, includes the name of the heads of a large number of schools and colleges; of many professional musicians; of mayors, ex-mayors and town councillors of many boroughs; of chairmen and members of Health Boards; of employers of labour, etc., etc.

The declaration is in the following terms, *viz.*: "Believing that in vaccination and re-vaccination we possess the best protection against epidemic small-pox, I should heartily welcome legislation making revaccination at school age obligatory on all but the children of conscientious objectors, or those who may be for a time excused on the ground of ill-health."

A concluding note states that the County Council of Herefordshire, the councils of the metropolitan boroughs of Finsbury, Holborn, and Westminster, and the corporations of Bootle, Bury, Manchester, Leamington, Newcastle-on-Tyne, St. Helens, Stoke-upon-Trent, and Sunderland, as well as the guardians of the Prescot Union, have resolved to present a petition to the House of Commons in support of the Bill.

THE DISEASES OF THE SUDAN.

IN an interesting article in the *Journal of Tropical Medicine* (April 15th), Dr. Andrew Balfour, the Director of the Wellcome Research Laboratory, Gordon College, Khartoum, gives an account of the common tropical and other diseases to be met with in the Sudan.

Malaria does not appear to be very common, but all forms of the malaria parasite have been seen. Several species of anophelina has been identified. Filariasis seems also to be rare in the Northern Sudan, nor has trypanosomiasis yet been discovered. Ankylostomata and other intestinal worms are common. Blackwater fever does appear, but seemingly rarely, in the Sudan, but is more common south of the place once called Fashoda. It has recently been shown that bilharzia is found among the Sudanese, and not confined only to Egyptian soldiers. As regards stone, it is noted that soft uratic calculi are the rule, but "phosphatic and uric acid calculi occur, the well waters are hard, and the Blue Nile waters issue from the granitic rocks of Abyssinia." It is interesting to note that even in the dry Sudan pulmonary phthisis is very common, and is attributed to "the ill-ventilated mud dwellings of the natives, the main object of which is to exclude the powerful rays of the sun." The dry Sudanese climate is good for bronchial asthma. Gangrene of the lung and cancrum oris are both common. Leprosy is common all over the Sudan, but only one or two cases of yaws has been identified. Dhobi's itch and keloids are common, as also is leucoderma, but the latter is said in some cases to be a result of syphilitic infection.

The presence of beri-beri is doubtful, but a form of endemic neuritis is known in Kordofan. Sleeping sickness has not yet been found in the Sudan, nor has the *Glossina palpalis* been identified. A form of low fever, "which is not enteric," occurs; during the hot weather there is a so-called "Khartoum fever," fairly sharp, but lasting only a week or 10 days, it is said not to be malarial, though it is "amenable to quinine." Malta fever has been described, but is certainly rare. Heat-stroke is not very common. Liver abscess is not uncommon, but "apparently unassociated with dysentery." Ainhum is said to exist, but Dr. Balfour has not seen a case. Hypertrophied mammæ is seen, but is more common in Central Africa. Our readers are aware of the commonness of gynæcomastia in India. Guinea-worm is fairly common; mycetoma is "exceedingly common for such a rare disease." Snake-bite is said to be rare, "considering the large number of poisonous snakes in the country." Cataract and corneal ulcer both occur, but Dr. Balfour has not much to say about them. Sudanese malingerers often put the juice of *Calotropis procera* (the Indian *madar*) into their eyes to produce inflammation. Blindness, from small-pox, is very common. Small-pox is endemic, but fortunately "the natives recognise and appreciate the benefits conferred by vaccination." Enteric fever is rare, and the natives are "apparently unaffected." Cerebro-spinal fever occurs sporadically, and in epidemics, typhus is only doubtfully present, if at all. Cerebro-spinal fever has been mistaken for typhus. Venereal diseases are very common. Cancer has been seen, and herniæ are not uncommon.

THE SURGERY OF ELEPHANTIASIS OF THE LIMBS.

THE following notes made by the well-known Chicago Surgeon, Nicolas Senn, on a paper by Dr. Lemoine (*Médicin Major 1pr. Classe, Troops Coloniales*) on the surgery of elephantiasis of the limbs will be read with interest by Civil Surgeons, practising in districts in which this complaint is common. We invite comment.

"According to Lemoine, who has seen much of this disease in Tahiti and surrounding islands, it may affect

most regions of the body, and not infrequently makes its appearance as an acute affection with all the symptoms characteristic of lymphangitis, including quite a violent continued or remittent form of fever, which lasts two or three months. The acute form is, almost without exception, complicated by synovitis of the joints of the affected limb, which he regards as almost pathogenic of the disease, differentiating it from ordinary forms of lymphangitis. After the subsidence of the acute symptoms and in the chronic form the disease is essentially a chronic lymphangitis, accompanied by marked enlargement of the veins. According to his observations the regions most frequently involved are the lower extremities, external genitals, and lastly, the hands and forearms. Last winter I was given an opportunity to see at the hospital and poorhouse at Antigua, West Indies, 90 cases of elephantiasis, and not in a single one of them did the disease involve the upper extremity, while in the French colony of the South Seas this is not infrequently the case. I do not know that a satisfactory explanation has ever been given why the disease should behave so differently in the two groups of islands. Lemoine, as well as other writers on elephantiasis, has seen the disease become stationary by the removal of the patients to a colder climate. Europeans become susceptible to elephantiatic infection after a prolonged residence in tropical countries. Lemoine does not agree with Manson, who believes that elephantiasis is caused by the filaria sanguinis and suspicions that the essential etiologic factor is a yet undiscovered microbe. He made blood examinations night and day of patients under his care, and was unable to constantly detect the filariæ in their embryonic state in the peripheral blood, and consequently claims that the presence of filaria in the organism is not an infallible diagnostic indication, and that their abundance is not proportionate to the intensity of the disease.

The fact that the elephantiatics improve in colder climates he regards as another proof that filariasis is not the essential cause of the disease. In a number of cases extirpation of the infiltrated enlarged lymphatic glands was followed by decided improvement, and in the case of a Tahitian the improvement remained at the end of two years. He has also operated on a number of cases by partial excision of the mass, first on one side of the limb, then the other, with decided benefit to the patient in most of them. In some cases deep incisions through the entire thickness of the indurated mass afforded relief and resulted in diminution of the size of the swelling. He relates the details of the case of a native, 50 years old, the subject of elephantiasis of the lower limbs, that he operated on in two stages several weeks apart, removing first a large section from the anterior and later from the posterior part of the swelling, and as shown by the accompanying illustrations in the report depicting the condition of the limbs before and after operation, with an excellent result. However, in some of the cases the results could not be maintained for any considerable length of time. In making the excision, the superfluous skin is excised with the underlying indurated tissues, and the skin margins reflected for some distance in order to afford sufficient room for a more liberal excision of the deep tissues.

In one case, that of a woman 38 years of age, the patient died two weeks after the second operation. Death was attributed to loss of blood and the debilitated condition of the patient when she entered the hospital.

In another case, a Tahitian, 35 years old, affected with elephantiasis of all limbs and the external genitals, he operated successfully on one of the upper limbs, the seat of an enormous swelling below the elbow. The excised mass weighed 15 kilograms. Owing to the large size of the swelling, the operation proved one of great difficulty, and owing to the tension incident to the approximation of the margins of the flaps the sutures cut through and the wound healed by granulation. At the second operation nearly the entire mass was removed, with the result that the wound healed after a prolonged suppuration, and the patient was relieved of the incumbrance caused by the great weight of the swelling. The relief afforded induced the patient to request additional operations for the removal of the swellings involving other regions of the body, but as the surgeon soon after left the island his desire could not be gratified.

The paper of Lemoine is summarized by him in the following conclusions:

1. Operate before extensive muscular degeneration has taken place and prepare the limb with the utmost care to insure asepsis.
2. Study carefully the anatomic relations of the swelling and operate where the swelling is narrowest.
3. Select the skin best adapted for flap formation with which to cover the wound. Transverse flaps are more likely to survive than lateral flaps. The best plan to make the flaps is to shape them so that the wound can be sutured in the form of a Maltese cross.
4. The median flaps should be cut first obliquely from without inward, taking care to make them sufficiently thick for the excision of the mass and the cutting of the lateral flaps; make a longitudinal incision through the middle of the mass and calculate carefully the extent of the diseased tissue to be excised. The lateral flaps should be thickest at the base and well supplied with blood-vessels.
5. To be absolutely sure of asepsis, avoid unnecessary manipulation and clamp rapidly all the bleeding vessels as they present themselves; tie all the veins with catgut and drain at the most dependent points.
6. Suture carefully with catgut for the deep and horsehair for the superficial sutures so as to secure the most accurate coaptation of the flap margins, as the sclerosed skin does not apply itself readily to the wound surface.
7. Avoid irritating antiseptic dressings, as they are productive of dermatitis in tropical countries, and especially if applied on skin diseased and badly cared for.
8. The first dressing should be aseptic, light and made to exercise gentle uniform pressure by bandaging.

IRRIGATION AND MALARIA.

WE have already referred to Lieutenant-Colonel Giles' views on the impolicy of permitting irrigation within the limits of cantonments. In the continuation of his article on his cold weather tour in India, he strongly condemns the use of irrigation within the limits of cantonments. He writes: "In Mian Mir, and other such places irrigation serves no useful purpose whatever beyond the paltry sum coming into the coffers of the Cantonment Fund from the rent of unused land and the profits of the grass farm," but irrigation must be given up, "unless the military authorities are willing to continue to be wilfully responsible for the avoidable destruction and deterioration of numbers of these scarce and expensive luxuries, our British soldiers." Lieutentant-Colonel Giles must not be understood to tilt at irrigation all over the country, but only in the immediate neighbourhood of cantonments, and he might have added civil stations.

Lieutenant-Colonel Giles sums up with the following recommendations, as to which we take exception to para. 4, in which "deep burial in pits" of night-soil is mentioned. This we certainly do not approve of, having seen what it means, and, moreover, such deep burial entirely does away with the nitrification and conversion of the night-soil into manure. When he advocates

septic tanks Colonel Giles is on more certain ground :—

"(1) Canal irrigation should be stopped, and the canals and their appurtenances carefully filled in and obliterated to within a mile of any building occupied by troops or followers.

(2) Every effort should be made to gradually and systematically improve surface drainage, and fill in depressions which may give rise to puddles during the rainy season.

(3) Landlords and tenants should be made responsible for the condition of the premises owned or occupied by them, so that the cost of filling in or otherwise rendering innocuous any puddles capable of breeding mosquitoes, and of cutting and removing undergrowth or other superfluous vegetation found within them, should be recovered from the party responsible, whether the premises be let or unlet.

(4) The system of trenching filth at present in use in military cantonments necessarily gives rise to a large area thickly covered with puddles during rainy weather. The filth should therefore be dealt with either in properly-constructed septic tanks or by deep burial in pits, under which latter system, if properly conducted, only isolated mounds without intervening excavations are left.

(5) All European barracks and all hospitals—whether European or Native—should be thoroughly protected with wire gauze on the plan devised by Prof. Celli, a sufficient area of verandah being in all cases included within the protection to admit of there being ample room for the men to lounge in at all times of the day. I believe it would pay Government well to incur the cost of putting native troops also under gauze protection, but there might possibly be some difficulty in securing that the system should be properly carried out Failing this, however, protection by smoke might be tried, as the Indian seems to glory in a smoky atmasphere, and the plan has already been successfully put into practice in an Indian jail.

(6) Every possible inducement should be offered to native followers and inhabitants of the bazaars to come into hospital for treatment.

(7) Quinine should be distributed gratuitously in the sudder and regimental bazaars to all persons applying for it who are known to be *bonâ fide* residents.

That these measures will suffice to "stamp out" malaria I do not for a moment pretend, but entertain no doubt that if conscientiously carried out they are adequate to reduce the incidence of malarial affections among the troops in garrison to a comparatively insignificant amount; and would finally point out that the readiest method of testing the question is to put these measures to the test of practical experiment."—J. T. M.

We incline to doubt if the "meat safe" method of protecting from mosquitoes will ever be tolerated in the hot weather in the plains of India, where every breath of wind is sought for, and where even the swing of the punkha or the whirl of electric fan is not so pleasant as the fresh evening breeze from over the plain.

GLYCERINE *v.* VASELIN LYMPH.

DURING 1902 and 1903 Captain W. F. Harvey, I.M.S., conducted a series of experiments in the Punjab on the relative efficacy and suitability of vaselinated and glycerinated lymphs derived from the Buffalo calf. He found that with properly prepared glycerinated lymph and careful vaccination success at the rate of 99·8 per cent. was obtained in 5,166 cases, of which 4,324 were inspected by Captain Harvey himself. He sums up the advantages in favour of glycerinated Lymph. (1) Glycerine is easier to mix with vaccine pulp than is vaseline, and in consequence its results are more likely to be uniform. (2) Glycerinated Lymph rids itself of extraneous micro-organisms, vaselinated lymph does not; glycerine lymph is fit for use after a fortnight's storage, and after a month's storage the only organisms remaining were spore-bearing bacilli and a large micrococcus, both of which can, it appears, be excluded if due care is taken by the Vaccinifer. (3) Glycerinated lymph gives rise to a characteristic scar, whereas the scab which follows the use of vaselinated lymph, owing to the inflammation it sets up, is usually composed of inspissated pus. (4) Glycerinated lymph appears to be more capable of resisting the effects of a high temperature than vaselinated lymph.

We would like to see a similar report on the relative efficacy of chloroformed and glycerinated lymphs.

THE Sanitary Commissioner with the Government of India in his Report (p. 107) sums up his account of the anti-malarial operations at Mian Mir Cantonment as follows (we have discussed them in another column):—

"Nevertheless, taking into consideration the length of time during which the operations have been carried on, the fact that they were conducted under favourable conditions, and that they were controlled during both the years of observation by medical officers possessing expert knowledge of the subject, the success attained scarcely warrants the conclusion that anti-mosquito operations would be an efficient practicable measure in every cantonment ... on the whole it would appear that the results of the present experiment were distinctly against the employment of anti-mosquito measures as a practical means of combating malaria in such a cantonment as Mian Mir."

The Sanitary Commissioner also reports that the experiments at Mian Mir show that the administration of 15 grains of quinine on two successive days weekly was a "most powerful means of combating malaria." We are glad to have this confirmation of the efficacy of large doses of quinine as a prophylactic —a point we have for some years past advocated in these columns.

MUCH doubt has recently been expressed of the value of the serum reaction as a means of diagnosing Malta fever in India. The Sanitary Commissioner sums up adversely to the existence of this disease in India. He says: "Many of the cases have exhibited very few, if any, clinical symptoms of the disease, and appear to have been returned as Malta fever on the strength of a positive serum reaction alone."

Truly in the case of Malta fever, as well as in other fevers, clinical observers have little

reason to thank the bacteriologists. We published last month a note by Captain Cornwall, I.M.S., on this subject.

WE commend to our readers the full and admirable resumé of the literature of trypanosomiasis, which appears in section IX of the 1902 report of the Sanitary Commissioner with the Government of India.

AN excellent resumé of the literature of plague bacteriology and of the alleged connection between rats and plague, and fleas and plague will be found in the 1902 Report of the Sanitary Commissioner with the Government of India, pp. 75-77.

AMONG the 480,737 cases of inoculation against plague in the Punjab, up to the cessation of operations on the occurrence of the Mulkowal catastrophe, only 4,667 were attacked and only 1,158 died.

MORE than 4½ million pice packets of quinine were sold through the post offices and other agencies during the year 1901 in Bengal, Assam, United Provinces, Central Provinces and Burma, This represents about 21 million grains of quinine. It has since been decided to give 7 grains of quinine instead of 5 in each pice packet, a step in the right direction.

EXPERIMENTS in Assam in 1902 showed that lanolin lymph, as manufactured in Assam, becomes ineffective after having been kept a month or at the outside six weeks.

THE following extract shows that tuberculosis is a problem in the prisons of Europe as well as in India:—"Schaefer, of Munich, found in a Bavarian prison that 13 per cent. of the prisoners admitted were suffering from tuberculosis. Almost half of the prisoners were also suffering from some form of tuberculosis. Schaefer lays special stress on the food as a vehicle for the transference of the bacilli into the body. He found cultivable tubercle bacilli in the cooking dishes, even after the dishes had been washed. He recommended the isolation of the sick from the healthy, the provision of country colonies for tuberculous prisoners, together with absolute cleanliness.

"Theodor, commenting upon the same topic, states: (1) that prisons favour a rapid form of phthisis. (2) The tendency to spontaneous cure found outside is not noticed in prisons. (3) They favour in a high degree the continuance of epidemics of tuberculosis."

DR. HILLIER has been sanguine enough to prophecy that "in about a generation" tuberculosis will be extinct in England and in Prussia.

MARTIN (*Public Health*) says: "Each succeeding year confirms my observation of 1898 that the annual epidemic of diarrhœa and of typhoid is connected with the appearance of the common house-fly, which becomes very numerous at the beginning of July, and breeds chiefly in privy-middens. The increase and decrease of the annual diarrhœa and typhoid epidemic can be foretold with a great degree of accuracy, an increase in the diarrhœa cases occurring in a week, and typhoid notifications in three or four weeks after an increase in the number of flies is observed. The annual epidemics of these two diseases begin and end with the appearance and disappearance of the domestic fly."

If this is so in England, how much more may it be the case in India—*pace* the advocates of the exclusive water theory?

In the *Johns Hospkin's Hospital Bulletin* (February 1901), Dr. Hirshbergs gives a lot of experiments to show that one species of anopheles, *viz.*, *anopheles punctipennis* does not transmit malaria.

MR. F. C. MADDEN, the Professor of Surgery in the Egyptian Government School of Medicine, points out in an article in the *Intercolonial Medical Journal* the extreme rarity of hydatid disease in Egypt, a fact which is in strong contrast to the extreme prevalence of other parasites in Egypt.

THE Government of Bengal has appointed a Committee to report upon the working of the existing septic tank installations in Bengal. The Committee consists of Colonel S. H. Browne, C.I.E., I.M.S., President, and the Hon'ble Mr. D. B. Horn, Chief Engineer, Major F. C. Clarkson, I.M.S., Sanitary Commissioner, Bengal, with Hon'ble Mr. L. P. Shirres, Secretary to Government, as Secretary.

TWO papers which we publish this month, *viz.*, Frostbite in Tibet, and Scurvy in Somaliland, well illustrate the extraordinary extremes of conditions under which the Indian Army has to fight, and the Medical Department to work.

THE following extract from a Consular Report shows the energetic way in which the Municipality of Para in Brazil grappled with a recent outbreak of plague in that city. "In addition to this wholesale inoculation, the streets and every room in every house of the block are most thoroughly disinfected, and this disinfection is repeated several times until the Health Board is satisfied that there is no further danger. Two or three hundred persons have been inoculated daily for the last three months, and tons of disinfectants have been used. Street sprinklers, fire engines, and the police and fire

brigades have been utilized in this work. No steamer plying on the river is allowed to leave the port unless every person on board has been inoculated. I believe that Para has successfully met the invasion of plague, and deserves great credit therefor."

THE District Medical Officer, E. I. Ry., Tundla, Dr. Waters, sends us the following copy of a circular which he has distributed among the Railway employés in his medical charge :—

"Should any case of plague occur in any company's or employé's house.—(1) The floor should be dug up 6 inches deep, mixed with fresh lime and watered. (2) The walls should be scraped and washed down with freshly slaked lime. (3) The roof, if *chuppor*, to be removed, reversed in the sun and beaten to get rid of the dust; if tiled or *kuttcha* a hole is to be made in it to admit sunlight and air.—(4) The house is to be left open and empty for three days."

Dr. Waters informs us that these methods have been used with considerable success.

THE excellence of the medical books published by Messrs. W. B. Saunders & Co. of London and New York is acknowledged by medical men in India. Their new list of forthcoming works is just to hand, and contains many of great interest to the medical man in India. Among them we may mention the magnificent treatise on Diseases of the Vermiform Appendix by Howard Kelly of Baltimore, Bickham's Operative Surgery, the second edition of which is just out. Howard Kelly's volume on the Vermiform Appendix contains no less than 400 superb illustrations.

Reviews.

Lyon's Medical Jurisprudence for India.—Edited by Lt.-Col. L. A. WADDELL, I.M.S., C.I.E., LL.D., formerly Chemical Examiner to the Government of Bengal and Examiner in Medical Jurisprudence in the Calcutta University. Calcutta: Thacker, Spink & Co. 1 vol., pp. 704.

WE have already (March, p. 113) welcomed the reappearance of this standard work on Medical Jurisprudence in India, but were only then able to give a view of the general contents of the volume. A further perusal and study of this, the third, edition enables us to bear strong testimony to the very large number of improvements effected by Lieutenant-Colonel Waddell, the present Editor. Lyon's *Medical Jurisprudence* has for over fifteen years been the standby of the Civil Surgeon in the mofussil, and we have no hesitation in saying that the present edition is superior in every way to the former ones. This superiority is shown not only in the better arrangement of the text and the illustrative cases, but in the wealth of the quotations from judicial records, reports and standard works on this subject. We decidedly prefer the present arrangements, whereby we have the illustrative cases quoted in smaller type, immediately after the discussion of any point. This at once gives the reader the information he wants, and saves him from having to interrupt his reading by referring to an appendix.

Of the many parts of the book, perhaps we were more pleased with the chapters on Poisons than with any other. We know of no book on the subject, in which these are treated with more thoroughness and detail. Take the important subject of arsenic poisoning for example. Here a long series of illustrative cases graphically describes all types of poisoning by this substance. A case of irritant arsenic poisoning is given, taken from the writer's own reports when Chemical Examiner; the type of slow poisoning is illustrated by a brief and clear account of the famous Maybrick case, the nervous type of poisoning is explained by a case from the Chemical Examiner's Report for 1884; the type of poisoning by a large dose yet without vomiting is shown by a case reported by Captain Robertson Milne, I.M.S., in our Medico-legal Number (June 1902).

Other cases quoted illustrate such cases as those mistaken for cholera, and cases where the symptoms are much delayed. Two cases are quoted where perforation of the stomach occurred. Then we have homicidal multiple cases, and exceptional cases of poisoning by arsenic. Also many *causes célèbres* are detailed, as the famous Baroda case, the De Ga case, &c. The chapter on the detection of arsenic in the viscera is excellent and the various processes for separating arsenic from organic mixtures are carefully and clearly detailed.

In the same thorough way the effects of the other poisons are described, every symptom or exceptional type being illustrated by an actual case, which has occurred either in India or elsewhere. The vegetable poisons are treated in like manner. Take the common *madar* (Calotrophis gigantea), a well-known wild plant. Not only is the plant and root pictured in an illustration but a case of poisoning by it is quoted in detail. Under head "Croton oil poisoning" the attempted poisoning case in a boys' school in Patna in 1899 is detailed. Under *abrus precatorius* or Jequirity will be found three detailed cases of poisoning by means of the *sui* or *sutāri*, a common means of cattle poisoning, but also used for homicidal purposes in India, as the three cases referred to show.

As we have said, we know of no better chapters on poisons than the above, in any work on Medical Jurisprudence. The fact that many years ago Lieutenant-Colonel Waddell did much good work on snake venom (and indeed was the first in India to introduce a scientific method of measuring the dosage of venom in experiments) led us to expect an interesting chapter on the action of snake venoms, and in this we are not disappoint-

ed, in fact we could well have had a longer chapter on this subject. It will be remembered that Lieutenant-Colonel Waddell was the first observer to establish the hypothesis that "immunity may be acquired by the inhibition of small doses of the venom." This important pronouncement was made in 1888, and our readers are well aware of the extent to which this hypothesis has been worked out by numerous observers in the last sixteen years.

We need not follow our author through his chapters on opium, datura, strychnine, aconite, and other less common poisons. In all the method is the same, and all the types of poisoning are in each case illustrated by the citation of actual cases.

We have dwelt chiefly on the chapters on poisoning in the volume, because, as we have said, we consider them to be exceptionally good, but there are many other parts of the book on which we fain would have lingered, but space forbids. We can only call attention to the very useful appendices, the complete index and the list of the vernacular names of plants and drugs.

In conclusion, we can with the utmost confidence recommend this volume both to the Civil Surgeon and to the legal practitioner. It is a complete, up to date, well written and satisfactory treatise on Indian Medical Jurisprudence, and its usefulness is not impaired by its comparatively low price, its compactness, and the general get-up of the volume.

An Atlas of Illustrations of Clinical Medicine, Surgery and Pathology.—Fasciculus XVII (Double Fasciculus); being VI and VII of New Series Xanthelasma and Xanthoma; changes in the Skin caused by Arsenic; Pemphigus and its Variants; Fractures and Dislocations; Miscellaneous. Plates A to O and XCVIII to CXVII. London: The New Sydenham Society. Agent, H. K. Lewis, Gower St. Price to non-members, one guinea.

THE contents of this fasciculus are practically described in the title page. Good examples of xanthoma diabeticorum are pictured as well as some of the comedonous types of xanthelasma and xanthoma: these are a continuation of the plates in a previous fasciculus.

The changes in the skin produced by arsenic are described under the three headings of pigmentation, keratosis and cancer; besides the illustrations, several drawings of microscopical sections of the affected skin are added. Some of the cases are from the recent outbreak at Manchester of arsenical poisoning from beer. The miscellaneous heading includes examples of bromide eruption, inherited syphilis; accidental vaccinia inoculation, scabies with other skin affections. A large dentigerous cyst is also figured.

In the surgical section some interesting skiagrams of injuries about the elbow joint are given; one case in particular of separation of the lower epiphysis of the humerus; in which the epiphysis has become united to the back of the diaphysis, and which shows that the limitation of flexion was due to the projecting lower end of the shaft of the bone; one year later the end had been so rounded off naturally that flexion was much increased, so that nature had accomplished what would have been done by an operation. Another excellent skiagram shows how easily a separated lower epiphysis of the femur can be reduced by simple flexion of the knee.

In commenting on this volume nothing further need be said beyond that it is in every respect up to the high standard of its predecessors.

An Atlas of Illustrations of Clinical Medicine, Surgery and Pathology.—Compiled for the New Sydenham Society. Fasciculus XVIII (Double Fasciculus), Eruptions, etc., caused by Arsenic (Plates A to G); Urticaria Pigmentosa (Plates CXVIII to CXXXI coloured, Plates E to H without colours); Illustrations of the Phenomena of Leprosy (Plates CXXXII to CXXV coloured; Plates I to Z without colour). London: The New Sydenham Society. Agent, H. K. Lewis, Gower St., W. C. Price to non-members, one guinea.

THE section on arsenic is a continuation of the last fasciculus and contains illustrations of pigmentation of the skin due to this cause; the various forms of eruptions and some cases of paralysis. These are obtained from cases in the recent Manchester epidemic. A number of histories of cases of arsenical cancer are included in the letterpress. In the section on Urticaria Pigmentosa the question whether the original wheals are produced by insect bites is discussed. Some of the plates are from the same patient at different periods of his life and show the difference in the character of the eruption in the early and late stages.

The plates illustrating leprosy include cases of dermatitis of the tuberous form and of forms of paralysis, and also dissections to show the fusiform enlargements of the nerves. These plates are mainly from cases in Bergen, and the history, as a rule, is condensed from Professor Leloir's monograph. The causation of the disease is not discussed. The plates and illustrations are as good as in previous fasciculi.

Dott. Carlo Muzio: Le Malattie dei paesi caldi, loro Profilassi ed igiene.—Milano: Ulrico Hœpli, 1904, XII—560 pages, 154 Woodcuts and 11 Plates. L. f. 50.

IN this manual, the articles on malaria, dysentery, yellow-fever, and Madura foot are satisfactory, having in view the very modest price at which the work is published, while the section on Parasites is really good. The rest of the work merits notice merely as a brief compilation from standard works on tropical pathology, which will, doubtless, be of service to those who prefer to have information on diseases with which they may meet during a voyage in the tropics boiled down for them. The section on life in the

Brazil might very well have been left out, we think, and the work thus shortened by 62 pages. To us in India, it is of interest to note that the work done by observers in India, whether published in the *Indian Medical Gazette* or other periodicals, is fully noticed, *e.g.*, the opinions of Buchanan and Rogers as to the etiology of Indian dysentery, and of Giles and Rogers as to *kala-azar* are given very fairly.

As a whole the work loses much through the carelessness with which the proofs have been read—*e.g.*, Queensland is given indifferently as Queesland and Queenland, while China appears as China—instead of Cina, the Italian name of that country—on many pages. In the copy sent us, pp. 64—81 of the article on malaria are missing, the binder having bound up a second series of pp. 1—16 in their place, so that one is not impressed by a sense of the care with which the book has been prepared by the great house of Hœpli, whose manuals *de omni scibili* are quite an institution in Italy.

Dott. A. D. Bocciardo: Elettricita Medica.—Milano: Ulrico Hœpli, 1904, XI—201 pages, 54 Woodcuts and 9 Plates. L. 2·50.

THIS work is wonderfully fully informative at the price, and will, we think, find a ready sale in Italy, and elsewhere where the Italian language is understood. But why should Crook's name have two *k's*, and Wimshurst's be denied the second *s*, seeing that both observers are so very well known in the electrical world.

Correspondence.

PIROPLASMA BIGEMINUM.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I have read with interest the article by Dr. A. Lingard and Major Jennings on Pyroplasma Bigeminum.

I may be allowed to make the following remarks:—

It may be remembered that in the year 1896, or thereabouts, considerable mortality afflicted Queensland Cattle owing to Tick Fever, and Dr. Hunt and Mr. Collins were deputed by the Queensland Government to proceed to America to study the disease there. These gentlemen wrote an interesting report on their return about the disease and illustrated it with drawings of the blood of Queensland Cattle as seen under the microscope.

In 1899 I undertook an investigation for the purpose of ascertaining whether Tick Plague already existed, in any form, in Bengal. Several hundred cattle were examined, with the result that the same appearances depicted by Dr. Hunt and Mr. Collins were found in a large percentage of outwardly healthy animals, as well as in those suffering from Rinderpest and other complaints. In January 1900 I submitted a fairly full report to Government, acompanied with drawings of affected Australian and local cattle, and I also appended drawings of blood as represented by Hunt and Collins, and as seen by myself.

Yours, &c.,
F. RAYMOND.

BENGAL VETERINARY COLLEGE,
19*th May* 1904.

"HOW TO CURE ENTERIC FEVER."

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—It is gratifying to note that my article under the above heading, in your May issue, has had one immediate result in eliciting an interesting letter to me from Mr. Norman Rudolf, the Indian representative of the great firm of Parke Davis & Co., which I beg leave to submit below for the careful attention of the profession. So entirely confident is he of the success of the Antiseptic-Eliminant cure, which I have advocated, that he has very generously come forward with a very liberal offer to supply certain valuable medicines *free of charge* to all Doctors interested, the only condition being *publication of results*, failures or successes. I am sure such a rare opportunity will be at once freely and gratefully responded to. Last year, at Simla, I held a most interesting conversation with Mr. Rudolf on the treatment of Enteric, and he informed me how wonderfully efficacious Acetozone was proving in this country, of which I have had confirmation since, but how difficult it was to induce Medical Officers to record their results. I trust this regrettable diffidence, if not laziness, will now cease and every one consider it his bounden duty to inform his struggling brethren how he progresses, for it is by such means alone that Medical Science can hope to advance. It needs but the very briefest details of vital particulars, for we do not require a medical student's minute clinical report. Widal's test should if possible confirm the diagnosis.

Of course one swallow does not make a summer, and it is only by the aggregation of reports on a congeries of cases that we can rightly judge of any method of treatment. I would therefore appeal in particular to officers of the R. A. M. C. in charge of Enteric Wards in Station Hospitals, of Staff Surgeons treating officers and families, of I. M. S. men in Civil Hospitals and with Gurkha battalions, and Civilian practitioners generally to give the methods advocated a thorough trial. At the same time, for our education, I hope every individual case will be reported on its merits without waiting if there be any likelihood of delay.

Yours, &c.,
P. W. O'GORMAN,
M.D., M.R.C.P., D.P.H.,
Major, I. M. S.

LAHORE,
20*th May* 1904.

SIR,—It is with the greatest interest that I have read your article on "How to cure Enteric Fever" in the May issue of the *Indian Medical Gazette*.

1. *Woodbridge Treatment of Enteric Fever.*—I had heard of Dr. Woodbridge, and the very favourable results obtained by his method of treatment, when I was in the United States in '95; and when in New York and Detroit in '98, I was so impressed with what I there learnt regarding this treatment that I determined on my return to India to make every possible effort in order that this treatment might receive a trial on an extensive scale in this Country. For this purpose I distributed many thousands of pamphlets and circulars to the medical profession, and I had printed literature which I sent out for some months on practically every letter leaving this Office to medical men; I also in certain instances presented free supplies of the necessary tablets and capsules for carrying out the treatment to certain medical men who seemed much interested. As a result of this work, a certain demand arose for the tablets and capsules used in this treatment; but although a number of medical men appeared pleased and some amazed by the entirely satisfactory results obtained, nevertheless this treatment has not been used to anything like the extent which its value, as demonstrated in the United States, would warrant. And hence I think your article will prove of great advantage to many practitioners. Dr. Woodbridge appears to lay stress upon the necessity of carrying out his method of treatment on exactly the lines as suggested by himself. As you state, the method of administration is somewhat complex, and by ordinary prescription writing it does not appear possible to carry out exactly Dr. Woodbridge's technique; he himself appears to realise this, and accordingly Parke, Davis & Co. marketed the necessary drugs for carrying out the treatment in the form of tablet triturates and capsules. For the administration of the drugs in the first and second stages of the treatment, tablet triturates are used, which are prepared without compression, and are of so friable and soluble a nature as to immediately break up and dissolve when swallowed; for the third stage of the treatment, when only Guaiacol Carbonate, Thymol, Menthol and Eucalyptol are being exhibited, soluble elastic Capsules are provided, which are perfectly flexible and dissolve almost instantaneously in the gastric fluid. An ample supply of both No. 1 and 2 tablets and of the capsules for the treatment of a case of Enteric Fever are put up in a neat box, which we sell in this Country from our Simla Office at Rs. 16; and a discount of 10 per cent. and postage paid to destination is allowed on orders from Government Institutions. As you are evidently interested in this matter, I have taken the liberty of forwarding to yourself, by parcel post, free of all cost, one of these Woodbridge Treatment Cases as a sample, and I would mention that we can always supply the same from this Branch should medical men be unable to obtain what they require from their local chemist.

2. *Acetozone.*—Some three years ago "Acetozone," to which you refer, was discovered, and from numerous reports published it appears that in this new body we have absolutely an ideal drug for intestinal antisepsis. "Acetozone" is Benzoyl-Acetyl-Peroxide, and as marketed it is mixed with an equal weight of inert insoluble matter. For the treatment

of Enteric Fever the 1-1000 solution is recommended, which is best prepared as follows:—20 grains of the "Acetozone" powder are added to a quart of water at a temperature of approximately 125° Fhr.; the bottle is then violently shaken for some minutes and a hazy solution results, the haziness being due to the presence of the above-mentioned added insoluble matter and to the Benzoic Acid which is formed by hydrolysis. The bottle should then be placed in an ice chest or in cold water, and in a couple of hours' time the precipitate will have settled and the clear supernatant liquid, being approximately 1-1000 "Acetozone" solution, is ready for use. Of this solution four ounces should be administered to the Enteric patient at least every two hours, and it is to be noted that the more of the solution which the patient will take the better. In addition to the regular administration as above, it may be given in the milk, lemonade, etc., which the patient is receiving. The flavour of "Acetozone" solution, which tastes somewhat pungent and peppery, is objected to by some patients, but this flavour can be very effectually masked by the addition of a little lemon juice and saccharine or oil of Wintergreen or fruit syrup or any similar flavouring agent. These flavouring agents, however, should not be added to the stock bottle of "Acetozone" solution, but should be added by the attendant at the time of giving the patient each dose. "Acetozone" solution gradually loses its potency, and it is recommended that a solution, not over 48 hours old, be employed. I think if the best results are to be obtained that it would be well for a gallon of "Acetozone" solution to be made up every morning and put in Ice for the patient. The suggestions I give above indicate what experience has shown to be the best way of making up the solution, but where this method may seem too troublesome it would be sufficient to shake up the necessary quantity of "Acetozone" with water at the ordinary temperature and leave the precipitate to settle; but even if the precipitate does not settle it would do no harm, as it is only inert matter and Benzoic Acid, for, although an Ice-cold clear solution is naturally more pleasant to the patient and more satisfactory in every way, it is not essential. The presence of this precipitate has caused considerable doubt in the minds of quite a number of medical men who, not understanding that it was added inert matter, endeavoured, by diluting the solution more and more, to obtain a clear solution, which of course never happened; and in certain instances they gave up the attempt in disgust, thinking that there was something the matter with the drug. For certain chemical reasons the inert insoluble matter must be added before we can put it on the market. Those who have had considerable experience in the use of "Acetozone" solution in the treatment of Enteric recommend that doses of calomel be given at the commencement, in order to clear out the bowels and stimulate the hepatic secretion; and the usual general treatment may be carried out, such as the reduction of temperature by cold baths, and the treatment of the various symptoms as they arise. By parcel post I have sent to you a ¼ ounce vial of "Acetozone," free of cost, as a sample, and I would mention that this preparation is always obtainable from our Simla office at the following rates:—

Rs.	19— 8 — 0	per	1	oz. vial
,,	9—14 — 0	,,	½	,, ,,
,,	5— 0 — 0	,,	¼	,, ,,

less 10 per cent and carriage free to Government Institutions.

I note the valuable suggestion which you make in your article as regards the advisability of a more extensive trial of the antiseptic method of treating Enteric, and of the good effect that would result from the publication of the results obtained. In this connection I would mention that I would be glad to furnish a quantity of "Acetozone" *free of cost* to any medical officer who wishes to experiment with same in the treatment of Enteric Fever; but I only make this offer to those medical men who would be willing to *publish their results* in some medical journal, the *Indian Medical Gazette* by preference, as unpublished results, however interesting to the individual medical man, would not be of much value in solving the problem of how to cure Enteric Fever. Perhaps you might see fit, if you approve of the Woodbridge Treatment Case which I have sent you, to mention these tablets and capsules in a further note in the *Indian Medical Gazette*. And as doubtless many medical men will be inclined to follow out your suggestion regarding the collection of clinical notes on the subject of intestinal antisepsis, perhaps you might think proper to also inform the medical profession of the offer of free "Acetozone" which I make. We have a very considerable stock of Acetozone" at this Branch, and we are constantly receiving supplies, but I am willing to supply "Acetozone" free to medical men to say a total quantity of Rs. 250 worth as a commencement, *provided only that results, good, bad or indifferent, would be published for the benefit of medicine in general.* If considerable interest seems to be exhibited in these experiments after the supply is exhausted, I would consider the advisability of making a further and larger distribution. In "Acetozone" we have a non-toxic, extremely powerful antiseptic, and one which is, I believe, entirely suited for the treatment of Enteric Fever on the lines suggested by yourself, and hence I am willing to supply free "Acetozone" to almost any extent to those medical men who will try the same and publish the results, so that the value of this drug may be as definitely demonstrated in India as it has been in America and other parts of the World.

I trust that you will pardon me should you consider the subject of my present letter out of place, but I was intensely interested in reading your article, and I am certain that the article must have attracted the attention of many; and it seems that now would be the time to have the value of "Acetozone" definitely determined, if perhaps you could see your way to communicate with the medical profession in these premises by means of a note to one of the medical journals.

Awaiting favour of a reply,

Yours very truly,

SIMLA, 16*th May*, 1904.

NORMAN S. RUDOLF, M.Sc.,
General Agent in India for
PARKE, DAVIS & Co.

OBITUARY NOTICE.

DEATH OF CAPTAIN H. M. MOORE, I.M.S., BOMBAY.

Communicated.

THE illness and death of Captain Moore, Resident Surgeon, St. George's Hospital, Bombay, from bubo-pneumonic plague on 3rd June, evoked the deepest sympathy of his countrymen. It would not be too much to say that the general feeling held something of the throb of a personal sorrow. The crowd of representative Englishmen who followed his remains on one of the hottest days in the year testified how touchingly the circumstances of his death went straight to the heart of the community. Though half expected, the end came with a sense of shock, for he had fought and rallied and relapsed and rallied again so often that his having survived so long seemed to be a guarantee of the ultimate triumph of his fine constitution.

He was taken ill on the 20th of May with fever and the indicative painful swelling in the arm-pit. In a few days, pneumonia—that terror of this fell scourge—set in, first in one lung, then in both, till at last the brave heart sank under the crescendo resistance that overpowered it.

He died at 37, having completed nearly ten years of service, leaving behind two lives grief-stricken at his cruel fate—his mother and the lady he was engaged to marry. Day by day the latter watched at his side torn by sleepless solicitude between the conflict of fear with hope, in which hope at last was beaten. And no note was wanting to complete the pathos of a tragedy which makes the whole world kin.

Personally popular as Captain Moore was, zealous and hard-working in the discharge of his duties, it was not this that moved public feeling so much, for, after all, they are sufficiently ordinary qualities. It was the knowledge that he had laid down his life, knowing the risks but not counting the cost, for the plague-stricken, whose lives were given him to rescue.

Moving about the plague wards, opening abscesses, handling pus, breathing an atmosphere of mingled exhalations and discharges, he was in close contact with that mysterious messenger of death who still defies all-comers, until with up-lifted finger the summons came, and he too had to join the long roll of the martyrology of medicine.

Bitter as the wrench is to private loves and private friendships, whenever the doctor, like the Pastor in the Bible, lays down his life for his flock, his profession that enjoins the last sacrifice in the service of suffering can only feel a noble exaltation at a death like this from one who interpreted his mission so worthily.

It is good for the public to be now and then startled by these self-sacrifices into a proper sense of their obligations to us doctors and the unselfishness even unto death with which we care for them in their hour of

sorest need. War for the soldier is only a brief episode in his life—an episode that never happens in the experience of very many. War for the doctor, in the sense of facing death, is in the ordinary hum-drum of his existence.

The commonness of the risks, real as they are in their interminable roll of victims, deprives them of the active appreciation which might very well be expected from the public. But it is the peculiar pride of our profession, instilled into us as an instinct from the day we enrolled our names as students on the hospital books, to seek, first and foremost and before all, the well-being of the sick and suffering, and for the rest taking our meagre chances of the few rewards a thoughtless world presents to us in honour and glory and gold.

Service Notes.

JAPANESE ARMY.

WE quote the following accounts of the medico-military organization of the Japanese and Russian Armies from our admirable contemporary, the *Journal of the Association of Military Surgeons of the United States* (May 1904):—

The British Army Medical Service was represented in the field during the Chino-Japanese War in 1894-1895 by Sir William Taylor, whose comprehensive report upon the medico-military arrangements of the Japanese army is of great importance to-day in view of the situation in the Far East. The following features, referring particularly to organization are of special interest:

MEDICAL SERVICE OF REGIMENTS AND BATTALIONS.

Infantry regiment:
- 2 Surgeon-Captains (1 may be Surgeon-Lieutenant-Colonel).
- 4 Surgeon-Lieutenants.
- 3 Chief Attendants.
- 12 Ordinary Attendants.
- 48 Reserve (*i.e.*, regimental) bearers.
- 6 Panniers (3 horses) and 12 stretchers (1 horse).

Cavalry battalions:
- 1 Surgeon-Major or Surgeon-Captain.
- 1 Surgeon-Lieutenant.
- 1 Chief Attendant.
- 1 Ordinary Attendant.

No panniers or stretchers, only the medical and surgical bag carried by each chief attendant.

Battalion of Artillery:
- 1 Surgeon-Major or Surgeon-Captain.
- 2 Surgeon-Lieutenants.
- 1 Chief Attendant.
- 6 Ordinary Attendants.
- 2 Panniers carried on a wagon in the field, and on a pack-horse in mountain artillery.

Battalion of Engineers:
- 1 Surgeon-Major or Surgeon-Captain.
- 1 Surgeon-Lieutenant.
- 1 Chief Attendant.
- 2 Ordinary Attendants.

No panniers or stretchers, only the medical and surgical bag carried by each chief attendant.

Battalion of Transport:—
- 1 Surgeon-Major or Surgeon-Captain.
- 2 Surgeon-Lieutenants.
- 3 Chief Attendants.

The Japanese regiment of infantry consists of three battalions of four companies each, the companies numbering two hundred men; the regimental strength being therefore 2,400. The forty-eight reserve or regimental bearers, four to each company, are trained men belonging to the regiment, distinguished by a red band worn above the elbow of the left arm. They are not neutralized by the Geneva Convention.

The scope of the regimental medical service in action comprises: 1st, Medical aid in the fighting line, and 2nd, Service in the temporary dressing stations. One-half of the personnel remains upon the line engaged, following closely its movements, and the other assists at the temporary regimental dressing stations, to which it has proceeded with the pack animals carrying the medical and surgical equipment. These stations are closed or advanced when the bearer companies begin their organized work; the regimental bearers, who have deposited their arms and knapsacks either at the dressing stations or with the regimental reserve, returning to their companies unless otherwise directed. The chief and subordinate attendants are employed with the front under fire, and primarily at the dressing stations, but the Japanese regulations seem to insist upon the regimental medical service keeping well closed up in touch with the battle front, relying upon the advance, or corresponding movement, of the bearer columns and field hospitals in their turn.

BEARER COMPANIES.

The bearer companies, of which there are two to each division, together with a central administration, or centre, form a divisional organization.

PERSONNEL OF CENTRE.

- 1 Captain, called captain of the medical staff corps (mounted).
- 2 1st or 2nd class under-officers (1 clerk, 1 superintendent cook).
- 1 Surgeon-Major as chief medical officer (mounted).
- 1 Surgeon-Captain (mounted).
- 6 Surgeon-Lieutenants (mounted); in guards 4.
- 1 2nd or 3rd class pharmaceutist officer.
- 3 Pharmaceutists; in guards 2.
- 10 Chief attendants; in guards 8.
- 26 Attendants, under-officers; in guards 20.
- 1 Commissariat officer, 2nd or 3rd class.
- 1 Clerk, 1st class, under-officer.
- 1 Transport under-officer (mounted),
- 3 Transport soldiers (1 at least a shoeing-smith, mounted)
- 36 Transport carriers with 36 pack horses; in guards 33.
- 2 Servants.
- 9 Grooms; in guards 7.

Total 104—*viz*, 11 officers, 43 under-officers, 50 men, 49 horses.

PERSONNEL OF BEARER COMPANY.

- 1 Captain of company (may be a lieutenant) (mounted),
- 1 Under-officer.
- 2 Sub-division commanders, 1st class under-officers.
- 6 Section commanders, 2nd class under officers.
- 145 Bearers (1 trumpeter, 1 tailor, 1 shoemaker); in guards 109.
- 1 Horse boy—soldier.

Total—156, *viz.*, 1 officer, 9 under-officers, 146 men, 1 horse; in guards 120.

Each company forms two sub-divisions of three sections each.

Total for centre and bearer companies, 416 officers and men, and 51 horses.

This column is under the control of the division commander, who is advised by the chief of the division medical staff, this latter assuming control when delay will ensue in communicating with the division commander.

Each bearer column bears the name of the division to which it belongs, and as to personnel and material is so organized that it can at any time be divided into two equal parts. In organizing, matters relating to medical personnel and medical and surgical equipment are dealt with by the chief of the medical staff of the division, but the rest is in charge of the transport battalion commander.

The order of march of the column is fixed by the division commander, but ordinarily one-half marches with the advance guard, in front of the second line of the first artillery company, and the other half in the main body, in front of the second line of the artillery regiment.

The function of the bearer column is to act between the fighting line and the field hospitals, serving the intermediate dressing stations primarily established by the regimental medical personnel; which thus relieved returns to the fighting front.

The dressing stations, of which the number is not indicated in the report, are established under the usual conditions as to protection from fire, accessibility by road, vicinity to water and are distinguished during the day by a white flag with a red cross, and by the national flag; while at night they are marked by red lanterns. The usual guidons are also placed.

The work of the dressing station is divided into three parts or sections, indicated by flags or banners of different colours.

(*a*) Receiving and forwarding section, blue. Personnel one medical officer, one chief attendant, one or two attendants.

(*b*) Operating section, white. Personnel: one surgeon-major, chief of the centre usually; two or three medical officers as assistants, and some chief attendant or attendants.

(*c*) Dressing section, red. Personnel: one medical officer, and some chief attendants or attendants, as assistants.

The functions of these sections are sufficiently indicated by their names. In each the most minute care is given to the records. The identification of patients is secured, if they are not able to give the information, by examination of the identity tag or metal label worn by all, the officer's name being engraved, the soldier's regiment and number given; from the pocket-book, cap, or clothing. The registry of all property is also provided for.

FIELD HOSPITALS.

There are six field hospitals to each division, bearing the Pivision name, and numbered from one to six. Three are

with the first line of transport and three with the second. Their function is to receive wounded from the dressing stations; or directly from the fighting line, to continue or complete the treatment previously received, and to be prepared for rapid evacuation should the relief of the bearer column be necessary.

The medical personnel and material, the clothing of the patients and the utensils, are selected by the chief of the medical staff; all other material and equipment, including animals, is provided by the commanding officer of the transport battalion. The latter also regulates the march and encampment of the field hospitals.

FIELD HOSPITAL PERSONNEL.

Nos.	Designation.	Officers.	Under-Officers.	Men.	Horses.
1	Chief Surgeon-Major ...	1	...	...	1
1	Surgeon-Captain	1	...	...	1
4	Surgeon-Lieutenants, 1st or 2nd	4	...	...	...
1	Pharmaceutist, 2nd or 3rd class	1	...	...	...
1	Commissariat officer of the intendance, 1st or 2nd class ...	1	...	...	...
6	Chief Attendants	...	6	...	...
3	Pharmaceutists	...	3	...	..
6	Attendants	...	6	...	...
34	Orderlies	...	...	34	...
1	Mechanic	...	...	1	...
2	Clerks, 1st, 2nd or 3rd class ...	...	2	...	...
6	Soldiers, as clerks and cooks ...	...	...	6	...
1	Transport under officer ...	...	1	...	1
3	Transport soldiers (one at least a shoeing-smith)	...	...	3	3
38	Carriers	...	...	38	38
6	Servants	...	...	6	...
2	Horse boys	...	...	2	...
116	Total ..	8	18	90	44

This would furnish to each division, 48 officers, 108 under officers, 510 men and 264 horses.

The quota of patients for each of the hospitals appear to be 200. Specific directions are given as to the choice of situations for these hospitals, shelter from fire, readiness of access, cleanliness of ground, avoidance of unsanitary villages. If, however, suitable houses or villages are available, they will be occupied, and a certain division of accommodation made.

(1.) Administrative officer (including financial), in the centre.
(2.) Receiving and despatching office.
(3.) Wards for patients.
(4.) Operating theatre.
(5.) Dispensary, including store for medical and surgical equipment, and for the mechanic.
(6.) Kitchens.
(7.) Bathrooms (sometimes despensed with).
(8.) Mortuary, in detached and separate buildings.
(9.) Latrines, in detached and separate buildings.
(10.) Recreation room.

The directions as to the routine administration, operations and records are carefully drawn. The position of the field hospital is indicated by the same means as previously described for the dressing stations.

TRANSPORT.

Passing from the field hospitals to the rear, along the lines of communication to the base, patients are in the hands of the hospital transport staff. There is an organization of this kind for each division, as to which the chiefs of the division medical and intendance staff, and the battalion transport commanders, are charged with certain duties. This divisional unit is controlled by the division commander, and operates only so far as the étape jurisdiction on the line of communication. It consists of:

1 Chief, Major or Captain.
1 Chief attendant.
1 Clerk.
3 Servants.
2 Medical officers.
2 Ordinary attendants.
3 Orderlies.

Total—3 officers, 4 under-officers, 6 men.

The étape medical staff governs the medical service on the line of communication and consists of:

1 Surgeon-Lieutenant-Colonel or Surgeon-Major as Chief of Etape Medical Staff.
1 Surgeon-Captain or Surgeon-Lieutenant.
1 Pharmaceutist (when there is no reserve medical store).
1 Under-officer.

There is also to each division a reserve medical staff, and a reserve medical store, the personnel of each being specifically designated, the number of animals allofted, its jurisdiction, and mixed responsibility defined.

To return for a moment to the sequence of medical control. The medical staff consists of:

For a Division:
1 Surgeon-Colonel, or Lieutenant-Colonel, as Chief.
1 Medical Officer.
1 Pharmaceutist officer.
2 Chief attendants (under-officers.)

For an Army:
1 Surgeon-General or Surgeon-Colonel as Chief.
1 Medical officer.
2 Chief attendants (under-officers).

Finally the supreme medical control is vested in a Field Medical Commander, who is the chief of the Medical Department of the War Office, and during war serves with the Grand Headquarters of the army. He has for his personal staff:

1 Surgeon-Lieutenant-Colonel or Surgeon-Major.
1 Pharmaceutist officer.
2 Clerks.

GENERAL HOSPITALS AT THE BASE.

The reserve hospitals are established either within military garrisons or outside, and civil hospitals or other suitable buildings are utilized. They bear the name of the locality where they are situated, as: "Shimoniseki Military Reserve Hospital," or "Hiroshima Military Reserve Hospital." They have the following personnel:

1 Chief Surgeon-Colonel, Surgeon-Lieutenant-Colonel, or Surgeon-Major.
2 to 3 Medical officers.
1 ,, 4 Pharmaceutists, officers.
1 Commissariat officer.
3 to 5 Chief attendants.
1 ,, 6 Pharmaceutists, under-officers.
2 ,, 8 Commissariat, under-officers or men.
30 ,,40 Attendants.
1 or 2 Mechanics.

42 to 70 officers and men (5 to 9 officers, 37 to 61 under-officers, and men).

For every increase of 40 patients over 120, 1 medical officer, 1 chief attendant and 10 to 13 attendants may be added.

Deficiencies among the medical and pharmaceutical officers may be supplied by temporary civil practitioners and pharmaceutical officers; among the attendants and pharmacists, by first or second class attendants, or by hired employees. The duties of all, except of the hospital chief, commissariat and under-officers, may be taken by members of benevolent societies.

The responsibility is to the commander of the territorial division.

THE SANITARY ORGANIZATION OF THE RUSSIAN ARMY.

BY

LIEUT.-COL. JOHN VAN RENSSELAER HOFF,

Medical Department, United States Army.

THE sanitary organization of the Russian Army is based upon the regimental hospital, each fighting unit (battalion) having its own sanitary personnel, appliances and transport. Upon this, in active service, is engrafted a divisional organization following the lines of modern military sanitation. The sanitary personnel, the surgeons, have no military rank; they belong to a class designated "official," which includes all persons not actually fighting men, and they are considered as civilians attached. In common with all other Government officials, they have a standing according to their rank in the "chin."

All Russian military officials are known technically as "Voyennii Klassnii Chinovniki," and belong to one or other of the following classes: Chaplains, intendance officials, surgeons, veterinarians, apothecaries, officials of the various military educational establishments, etc. In these groups there are no special names for grades, which are only denoted by the particular class-rank in the "chin" which the individual official has, and which is, in effect, a social or court standing. For example all surgeons are designated "vrachi," yet they have rank in the "chin," from the third class to the ninth class, the highest medical official having third class, and the lowest (Junior Surgeon) ninth class rank. The highest apothecary official ranks with the fifth class, etc. All surgeons wear a uniform of dark green cloth, the coat (tunic) having cuffs and collar, of the same colour, piped with scarlet. The shoulderknots are narrower than those of combatant officers, and are ornamented with silver lace. The trousers are dark green in colour, without stripe, and the undress cap is of the same colour, with a dark green band and red piping. The subordinate personnel wear the same uniform as the regiment to which their hospital belongs.

The organization of the personnel of the Medical Department of the Russian Army is as follows:—

I.—Chief Medical Department:

1 Chief Surgeon, 1 Assistant, 1 Chief Inspector, 4 Principal Officials (Surgeon, Veterinarian, Pharmacist, and Professor Oculist), 13 Surgeons, 1 Pharmacist, 18 Minor Officials, 45 Clerks, and 4 Couriers.

In addition to the foregoing the Department has at its disposal:

5 Surgeons, 15 Pharmacists, 15 Veterinarians, and 28 Junior "Feldshers."*

II.—Military Districts and Staff:

a. District Military Medical Department:
1 Chief, 1 District Medical Inspector, 1-2 Assistants (Surgeon and Pharmacist), 1 Oculist Surgeon and 1 Veterinarian, 1 Surgeon and 1 Pharmacist, as Secretaries, and an indefinite number or "Feldshers" and Clerks.

b. Staff of Army Corps:
1 Corps Surgeon and 1 "Feldsher."

c. Staff of Infantry of Cavalry Division:
1 Division Surgeon.

d. Staff of Field and Reserve Artillery Brigade:
2 Surgeons, 1 Veterinarian, and 7 "Feldshers."

e. Staff of Sapper and Railway Brigade:
1 Surgeon.

III.—In the Line:

a. In a regiment of Infantry, consisting of 4 battalions, there are 1 Senior and 4 Junior Surgeons ("vrachi"), 1 Senior and 12 Junior Dressers ("Feldshers"), 1 Compounder ("Abtechnii Feldsher"), 14 Dresser pupils, 1 Hospital Sergeant ("Nadziratri Volriki"), and 3 Hospital Orderlies.

All these are classed as non-combatants.

The average strength of an infantry battalion is about 1,000 of all ranks; and the combatant companies, in a 4-battalion regiment, are numbered from 1 to 16. All of the non-combatant officials in a regiment are grouped into what is called a non-combatant company, which is not numbered. The medical personnel alloted to other fighting units is in proportion to strength, based upon the requirements of an infantry regiment. A cavalry regiment has usually a strength of from 777 to 1,000 men, depending upon the number of squadrons (four or six). The artillery is organized into brigades of six battalions each, the average strength being 1,100 of all ranks in each brigade, etc.

b. A Cavalry Regiment (4 Squadrons) has:
1 Senior and 1 Junior Surgeon, 1 Veterinarian, 6 "Feldshers" (in 4-Squadron Regiment, 7), 4 Veterinary "Feldshers," 2 "Feldsher" pupils, 1 Supervisor of Sick (non-commissioned officer), and 2 Hospital Attendants.

c. Of the Artillery:
A Foot Battery has 2 "Feldshers," 1 "Feldsher" pupil, 1 Hospital Attendant. A Horse Battery the same as a Foot Battery. A Mortar Battery 4 "Fieldshers" and 1 Hospital Attendant, and the Artillery Parks (Flying and Movable), each, 1 Surgeon and (?) "Feldshers," etc.

d. A Sapper Battalion has:
1 Surgeon, 7 "Feldshers," 5 "Feldsher" pupils, and 2 Hospital Attendants.

e. Reserve Infantry Battalion (4 companies) has:
1 Surgeon, 1 Junior Surgeon, 7 "Feldshers," and 5 "Feldsher" pupils, and

f. A Fortress Infantry Battalion the same.

g. A Depôt Cavalry force ("Cadre") has:
1 Junior Surgeon, 1 Veterinarian, 4 "Feldshers," 4 Veterinarian "Feldshers," 2 Hospital Attendants, etc.

The material, tentage, etc., of the regimental hospital, which always accompanies the fighting organization to which it belongs, is transported in four one-horse medical store carts. Besides these there are four four-horse ambulance wagons, and a two-horse wagon to carry thirty-two stretchers (two per company). In peace or war these regimental medical units are completely organized, and the personnel is identical, except that the fourteen "Feldsher" pupils are replaced by eight additional Junior "Feldshers," and the capacity of the hospital is extended from sixteen to eighty-four beds (twenty-one to each battalion of a thousand strong).

Each "Feldsher" carries a knapsack containing dressing materials. In addition to the "Fieldshers," there are detailed from each company six men who are specially trained as bearers. A four-battalion regiment, sixteen companies, each of two hundred and fifty men, furnishes ninety-six bearers from the combatant strength; these men were the arm-band of the Geneva Convention only when actually employed in bearer work.

During an action the regimental medical personnel form collecting stations, to which the wounded are carried. But the regimental hospitals are ordinarily not pitched, except at the time the regiment goes into camp.

During active service the various medical units, required on mobilization, are organized from the regimental peace establishment, supplemented by men from the reserve, the drivers coming from the cavalry reserve.

These units are in addition to the regimental medical organization, and are as follows, *viz.*:—

A. Sanitary Division.

To each infantry division in the field is attached what is called a "Sanitary Division," and this forms a part of the divisional, supply, and transport column. The Sanitary Division consists of a bearer company, a divisional ambulance hospital, and two "Mobile" field hospitals. In the case of sanitary divisions attached to active, as distinguished from reserve infantry divisions, two extra "Mobile" hospitals are included, making four in all for that division. The divisional sanitary organization is intended for the establishment of a main dressing station, and to otherwise collect and despatch the wounded from the fighting line to the field hospitals. The personnel consists of:

1 Officer (combatant) commanding.
5 Surgeons.
1 Official (Quartermaster).
29 "Feldshers," etc.
217 Non-Commissioned Officers and men of the Bearer Company.
39 Non-Commissioned Officers and men of the Transport Corps.

Total, 292.

The equipment consists of fifty stretchers, two thousand bandages (divided in ten packages), fifty first-aid knapsacks, the necessary medicines, stores, etc., two operating tables, and four dressing tents. The transport comprises eight four-horse ambulance wagons, three one-horse medical store carts, fifteen two-horse store wagons, and one four-horse store wagon (for heavier parts of material).

Longmore gives a somewhat different organization. According to him the personnel of the Sanitary Division consists of:

Field hospital (to accommodate six officers and 160 men): Eight Surgeons, sixteen Dressers, fifty Orderlies, with the necessary (?) officials.

Bearer Company: One officer, one Sergeant-Major, eight Sergeants, and 200 Bearers.

Transport Section: One officer, and 108 drivers.

Total, 393.

With the divisional sanitary train are: Twenty-four ambulance wagons, an equal number of store wagons, six stretcher carts, two medical store carts. Each train carries 144 stretchers.

The organization of the bearer company is practically identical with that of the other companies; the uniform is the same as that worn by the 1st Regiment of the division to which it belongs, and the number of the division is shown on the shoulder-loop. The brassard of the Geneva Convention is worn, and no arms carried except by the drivers, each of whom has a hatchet, and who do not wear the brassard.

B. The Divisional "Mobile" (field) Hospitals constitute the third line of medical assistance, and each affords accommodation for ten officers and 200 men. Their rôle, location, and movements are the same as in other armies. The personnel of these hospitals consists of: Two Surgeons, two other officers, 107 non-commissioned officers and men (including twenty-eight for transport duties), four Sisters of Mercy, fifty-seven horses, and twenty-five wagons.

The equipment includes bedding and clothing for ten officers and 200 men:

210 bedsteads.
105 tables.
40 stretchers.
3 large tents, each to hold 20 men, and the necessary medical stores, food, etc.

The transport comprises:

19 two-horse store wagons.
1 four-horse wagon for heavy parts of tents.
4 one-horse store carts.
1 four-horse carriage for the sisters.

The uniform of the personnel of these hospitals is the same as that of the 4th Regiment of the division, with the number of the hospital on the shoulder-loop. The arms and the use of the brassard are the same as described for a bearer company.

During a battle the divisional "Mobile" hospitals are established somewhere in rear of the line of battle. In addition to their permanent personnel, when necessary, Surgeons and Dressers are detailed from the regiments in sufficient number to meet the requirements of any particular emergency.

The divisional ambulance hospital constitutes the dressing station, which is located in the immediate rear of the fighting line. Its personnel is furnished by detail from the regimental Surgeons and the Bearer Company.

* "Feldshers" correspond in their duties to the Hospital Corps, U. S. Army.

C. The Reserve Field Hospitals, of which two hundred and forty are maintained, and in war are established at points on the line of communication. They have no transportation, their personnel and stores being forwarded by rail, boat, or by requisitioned transport. Each has :

5 Surgeons.
4 Officials.
80 "Feldshers," etc.
4 Sisters of Mercy.

Their organization is identical with that of the divisional field hospitals, except as to transport.

D. The Military Sanitary Convoys, twenty in number, are mobilized in time of war for the transport of wounded and sick from the front to the rear. The strength of each is one combatant officer in command, two surgeons, ninety-eight non-commissioned officers and men (including seventy-one for transport work), two Sisters of Mercy, 137 horses, and thirty-six carriages, including twenty-seven four-horse ambulances, one four-horse kitchen wagon, seven two-horse store wagons, and one one horse medical store cart.

E. The Field Dispensaries are intended to supply the divisional and field hospitals with the medical and surgical stores they require. In time of war seven of these dispensaries are mobilized, each is provided with a supply equal to the requirements of four months, and has a personnel of three officials and twenty-one non-commissioned officers and men. Transport is provided when required. According to Longmore, twenty-eight store wagons are attached to each field dispensary, some of which follow the army in advance, and others are distributed between the base and other points.

F. There are seventeen Permanent Military Hospitals located in European Russia, eleven in Caucasus, and six in Asia—divided into four classes, as follows :—

PERSONNEL.	1st Class. 200 Beds.	2nd Class. 400 Beds.	3rd Class. 650 Beds.	4th Class. 1,100 Beds.
Chief	1	1	1	1
Surgeons	4	7	10	18
Officer	...	...	...	1
Officials	4	5	8	10
Apothecary	1	1	1	1
"Feldshers"	8	13	20	33
Lower Grades	76	114	152	233

G. Local Hospitals. There are also in Europe about sixty, in Caucasus about forty, and in Asia about sixty, of from 50 to 350 beds each. Their personnel consists of two to seven surgeons, one to two apothecaries, one hospital supervisor, three to eleven "feldshers," seven to twenty-seven lower grades, and one nurse for each eight patients.

H. In every independent unit or command there is a Troop Hospital, which is to be opened when no military or local hospitals are available. Instead of troop hospitals, receiving rooms of sixteen beds may be opened in each command. The personnel of these troop hospitals is determined by the regulations governing the sanitary service, as already described under "III.—In the Line," for each regiment, battery, etc.

I. The Medical Depôts, of which the central medical depôt is at St. Petersburg, and nine other military medical depôts are established at different points in the Empire, are for the purchase, storage, and issuing of supplies.

Longmore says that all temporary hospitals are under the orders of the Director-General, who is attached to the General Staff of the army. Whether or not he be a physician does not appear—probably not, inasmuch as Longmore furthermore says that the Director-General is assisted in his duties by the Chief Surgeon, as regards the medical details, and that the personnel of the hospitals are under his orders, except the surgeons, who are, however, subordinate to him in matters of discipline and administration. It is part of the duty of the Director-General, in active service, to see that all hospitals at the front are evacuated as rapidly as possible, in accomplishing which, if the ordinary means of conveyance should be insufficient, recourse can be had to the wagons of the Intendance or of the country in which operations are being carried on. It is also his duty to establish new field hospitals and, generally to control the supply, and see to the efficiency of all military sanitary establishments. He receives his orders from the Chief of the General Staff, and is in immediate communication with the Minister of War regarding medical supplies, etc.

The present total of the Medical Department of the Russian army does not materially differ from that of 1886, which was :—

2,808 Surgeons,
232 Pharmacists,
3,804 Medical "Feldshers,"
3,455 Company (squadron, battery) "Feldshers,"

and which may be said to represent the peace establishment of the Russian Military Sanitary Organization.

THE following Indian Medical Service Officers are now employed in the Jail Departments of the various Provinces, —Madras, Lieutenant-Colonel W. O'Hara, as Inspector-General, Madras ; Captain F. Browne, I.M.S., at Rajamundry ; Major C. F. Fearnside, I.M.S., at Vellore. Out of the eight Central Jails in Madras any four are held by Commissioned Medical Officers. In Bombay there are three Central Jails. Major J. Jackson, I.M.S., is Superintendent of the Yerraoda Central Jail, but is officiating as Inspector-General ; Captain G. C. Laing, I.M.S., and Captain H. J. R. Twigg, I.M.S., are also in the Bombay Department. In Bengal, Major W. J. Buchanan, I.M.S., is Inspector-General, Captain J. Mulvany, Captain J. M. Woolley and Captain R. J. Dalziell are employed in charge of Central Jails in Bengal, and two second class Central Jails are held as collateral charges by the Civil Surgeons at Rampore Baulia and at Hazaribagh. In the United Provinces all the Central Jails are in charge of I.M.S. officers, *viz.*, Major E. Jennings at Bareilly ; Lieutenant-Colonel R. R. Weir at Fatehgarh, but acting as Inspector-General, *vice* Major C. Mactaggart, I.M.S., on furlough ; Captain Prall is Superintendent of Lucknow ; Major Hudson is Superintendent at Naini (Allahabad), and Major W. H. Gray at Benares. There are seven whole-time appointments (including the Inspector-General) in the United Provinces for Commissioned Medical Officers. In the Punjab there are four whole-time appointments, also including that of Inspector-General. They are as follows :—Lahore, Major G. F. W. Braide, I.M.S ; Mooltan, Major R. J. Macnamara ; Montgomery, Captain C. H. Bensley, and Captain E. L. Ward, temporarily employed. Lieutenant-Colonel T. E. L. Bate, I.M.S., C.I.E., is Inspector-General, but will probably soon receive another Administrative appointment. In Burma there are four whole-time appointments, *viz.*, that of Inspector-General, Lieutenant-Colonel E. P. Frenchman ; Rangoon, Major C. J. H. Bell, on furlough, and Captain A. Fenton officiating ; Insein, Captain B. J. Singh, I.M.S., on furlough ; Major W. G. Pridmore, I.M.S., officiating ; Mandalay, Captain P. Dee, I.M.S. Three other second class Central Jails, *viz.*, Bassein, Thayetmyo, and Myingyan, are held as collateral charges by the Civil Surgeons. In the Central Provinces Lieutenant-Colonel Banatvala has been appointed, we understand, Inspector-General ; at Nagpur is Captain F. O. N. Mell ; Major W. B. Lane, I.M.S., has lately gone from the Punjab to Jubbulpore ; and Captain H. D. Peile is sub. *pro tem.* Superintendent of Raipur Central Jail. In the Berars the two Central Jails are held as collateral charges, *viz.*, that of Amraoti by Lieutenant-Colonel R. B. Roe, Civil Surgeon ; and Akola by Lieutenant-Colonel E. W. Reilly, I.M.S. Assam has no Central Jail, and in Coorg, Lieutenant-Colonel D. S. E. Bain, I.M.S., is in charge of the Mercara Central Jail.

No. 395.—The Governor-General in Council is pleased to direct that the following shall be substituted for paragraphs 3 and 4 of the Home Department Notification No. 437, dated the 25th July 1893, as amended by the Home Department Notifications noted on the margin, regarding the remuneration of medical officers for attendance on native chiefs and nobles and native gentlemen of high position in a Native State :

No. 1930, dated the 8th October 1900.
No. 852, dated the 12th June 1901.

"3. The native chief, noble or gentleman may offer any medical officer of Government attending him such fee as he thinks fit. The offer made will be reported by the medical officer to the Political Agent or other officer of Government exercising political functions in the State of which the said chief, noble or gentleman is a resident, for the consideration of the Local Government within whose jurisdiction the Native State is situated. This report will state the period during which he was in attendance and the number of visits paid. The medical officer will at the same time submit to the Administrative Medical Officer, or Inspector-General of Civil Hospitals, to whom he is subordinate, a full medical statement of the case showing the nature and extent of the relief afforded, the importance of the case from a professional point of view, and the circumstances in which he attended the patient. The Local Government is required to satisfy itself that the fee proposed is not out of proportion to the relief afforded and to the circumstances of the case and has authority to sanction the acceptance of a fee not exceeding Rs. 2,000. In considering these questions it will, if necessary, refer to the Administrative Medical Officer or Inspector-General of Civil Hospitals, as the case may be. If the proposed fee exceeds this sum, the matter will be submitted, with a full report, by the Local Government for the consideration and orders of the Government of India.

"4. The reports prescribed in the preceding paragraph will not be required from a medical officer when the fee does not exceed Rs. 50 a visit, or Rs. 1,000 in the aggregate for repeated visits in the course of a year."

CAPTAIN C. MILNE, I.M.S., is appointed to act as Civil Surgeon of Fyzabad.

CAPTAIN W. H. KENRICK, I.M.S., is granted two months and eighteen days' privilege leave from 21st May.

CAPTAIN T. G. N. STOKES, I.M.S., Civil Surgeon, Bilaspur, C. P., is granted three months' privilege leave from 1st June.

LIEUTENANT-COLONEL E. W. REILLY, I.M.S., has returned to Akola as Civil Surgeon.

MAJOR E. A. W. HALL, I.M.S., Civil Surgeon, Lakimpur, Assam, is granted combined leave for six months.

MAJOR E. R. W. C. CAROLL, I.M.S., Civil Surgeon of Shillong, is transferred to Lakimpur.

MAJOR E. C. HARE, I.M.S., is appointed Civil Surgeon of Shillong, and Military Assistant-Surgeon Boermel is appointed Civil Surgeon of Kamrup.

THE services of Captain A. Hooton, I.M.S., are placed permanently at the disposal of the Government of Bombay.

MAJOR R. C. MACWATT, I.M.S., is granted two years' combined leave.

LIEUTENANT-COLONEL R. D. MURRAY, I.M.S., is granted the temporary rank of Colonel, with effect from 3rd April 1904.

MAJOR B. H. SCOTT, R.A.M.C., is appointed Sanitary Officer, Punjab Command, *vice* Major J. C. Weir, R.A.M.C.

CAPTAIN W. R. P. GOODWIN, R.A.M.C., acts as Personal Assistant to P. M. O., Punjab Command.

LIEUTENANT-COLONEL W. A. LEE, I.M.S., is appointed to the Second District, Madras.

LIEUTENANT-COLONEL W. F. THOMAS, I.M.S., is appointed District Medical Officer of Trichinopoly.

LIEUTENANT-COLONEL W. B. BROWNING, C.I.E., I.M.S., is due to return from leave on 31st October 1904.

LIEUTENANT-COLONEL H. THOMSON, I.M.S., is not due to return from leave till 2nd March 1905.

MAJOR R. ROBINSON, I.M.S., has been granted 18 months' combined leave.

CAPTAIN T. H. FOULKES, I.M.S., will be absent on leave till 31st March 1905.

CAPTAIN E. M. ILLINGTON, I.M.S., will be on leave till 9th July 1905.

CAPTAIN H. KIRKPATRICK, I.M.S., is due to return from leave on 19th August 1904.

CAPTAIN W. H. TUCKER, I.M.S., has been transferred from Vellore to Salem.

CAPTAIN J. J. ROBB, I.M.S., is posted to Coimbatore as District Medical Officer.

LIEUTENANT S. BOSE, I.M.S., is posted to Cuddapah as District Medical Officer.

LIEUTENANT S. R. CHRISTOPHERS, M.B., I.M.S., on special duty to hold charge, in addition, of the King Institute of Preventive Medicine, Madras.

THE services of Captain C. H. Bensley, I.M.S., are placed permanently at the disposal of the Punjab Government for employment in the Jail Department.

THE following promotions are announced in *Gazette of India* (May 7th):—
Lieutenant G. T. Milchem, I.S.M.D., to be Honorary Captain.
1st class Assistant-Surgeon A. D'Cruz to be Honorary Lieutenant.

MAJOR J. S. S. LUMSDEN, I.M.S., Civil Surgeon, Bahraich, U. P., was granted six weeks' privilege leave from 15th May.

MAJOR J. M. CADELL, I.M.S., Civil Surgeon, Fyzabad, is granted 18 months' combined leave from 27th April.

CAPTAIN T. HUNTER, I.M.S., Superintendent, Central Prison, Farrukhabad, officiates as Civil Surgeon of that district, in addition to his other duties.

MAJOR W. G. P. ALPIN, I.M.S., Civil Surgeon of Gonda, was to hold visiting medical charge of Bahraich, and Civil Assistant-Surge on B. B. Banarji was to hold civil medical charge, on the departure on leave of Major Lumsden, I.M.S.

CAPTAIN C. M. GOODBODY, I.M.S., was appointed to act as Civil Surgeon of Sultanpore, *vice* Captain C. Milne, I.M.S.

MAJOR J. G. HOJEL, M.B., B.Ch., I.M.S. (Bombay), has been granted an extension of leave for six months.

CAPTAIN G. C. LAING, I.M.S., handed over charge of the Ahmedabad Central Jail to Captain C. S. Lowson, I.M.S., on 3rd May 1904.

HONORARY LIEUTENANT W. HEATHCOCK, I.S.M.D., Civil Surgeon, Unao, U. P., was granted six weeks' privilege leave.

CAPTAIN T. W. A. FULLERTON, I.M.S., Civil Surgeon of Cawnpore, holds additional civil medical charge of Unao district.

INDIAN FOLLOWERS' RELIEF FUND.—The attention of officers commanding corps and of departmental officers is invited to G. O. C. C. No. 425 of 1903, notifying that on application to the Honorary Secretary and Treasurer, Indian Followers' Family Relief Fund, at Army Head Quarters, Simla, relief will be afforded to the families of followers who are either temporarily or permanently incapacitated, or have been killed in action, or died from disease due to field service, with the Expeditionary Force in Somaliland.

COLONEL B. O'BRIEN, I.M.S., when he went on leave was granted 8 months on medical certificate under Art. 717, A. R. I., Vol. I, Part I. This included 90 days' privilege leave.

ON coming into civil employ in Bengal Captaln G. King, I.M.S., is appointed Civil Surgeon of Dinajpur.

CAPTAIN MEGAW, I.M.S., is transfered from Dinajpur to Jalpaiguri, and Captain Thornley, I.M.S., is transferred from Jalpaiguri to Bhagulpore as Civil Surgeon.

WITH the appointment of a new Viceroy the personal staff appointments are announced. Major W. Molesworth, I.M.S., who was Surgeon to the Governor of Madras, remains as Surgeon to the Viceroy. Assistant-Surgeon K. Mackenzie, Bombay; Assistant-Surgeon C. A. Lafrenais, Madras; Assistant-Surgeon N. L. Basak, C. P.; and Assistant-Surgeon Maung Tha Nus, Burma, Senior Assistant-Surgeon Alla Muhammed, and M. N. Ohdedar, are appointed Honorary Assistant-Surgeons.

CAPTAIN C. J. ROBERTSON-MILNE, I.M.S., on return from leave, is replaced on special duty under the Sanitary Commissioner with the Government of India.

THE services of Lieutenant T. W. Harley, M.B., I.M.S., are placed temporarily at the disposal of the Government of Madras.

LIEUTENANT J. R. J. TYRELL, I.M.S., officiated as an Agency Surgeon in Bhopal from 22nd January to 3rd May 1904.

LIEUTENANT-COLONEL R. MACRAE, I.M.S., A.M.O., Central Provinces, was granted the temporary rank of Colonel from 15th April 1904, and Lieutenant-Colonel P. H. Benson, I.M.S., was granted the temporary rank of Colonel while officiating as P. M. O. of a district.

LIEUTENANT EMSLIE SMITH, I.M.S., is appointed to the charge of the Wing, 3rd Brahmins, *vice* Captain J. Fowler, I.M.S., transferred to civil employ.

LIEUTENANT C. A. GILL, I.M.S., has taken over the Civil Medical duties of the Tochi Valley from Lieutenant F. T. Thompson, I.M.S.

CAPTAIN W. H. ORR, I.M.S., Civil Surgeon, Mainpuri, U. P., was granted six weeks' privilege leave from 15th June 1904.

CAPTAIN R. G. TURNER, I.M.S., Civil Surgeon, Etawah, holds visiting charge of Mainpuri, and Assistant-Surgeon T. N. Singh holds medical charge during Captain Orr's absence on leave.

DEPUTY SURGEON-GENERAL GEORGE COCHET CHESNAYE, late Bengal Establishment, died on April 12th at Bournemouth in his 67th year. Appointed Assistant-Surgeon, February 10th, 1859, he became Surgeon-Colonel, January 14th, 1889, and retired from the service in 1894. From 1859 to 1864 he was attached to the 3rd Bengal European Light Cavalry and to two troops of Bengal Horse Artillery. During this period he rendered excellent service at Mian Mir and Amritsar in the cholera epidemic of 1861, for which he received the high approbation of H. R. H. the Duke of Cambridge and H. E. the Commander-in-Chief in India. His war record is as follows:—Hazara Campaign, 1868 (medal with clasp); Lushai Expedition, 1871-2 (mentioned in dispatches, clasp); Afghan War, 1878-80, as Principal Medical Officer, and in charge of the Staff, 1st Brigade, 1st Division, being present at the capture of Ali Musjid, the expedition to Sherpore in December 1879, the action of Saidabad, the operations in Kohistan, the march from Kabul to the relief of Kandahar, and the battle on September 1st, on the following day being placed in charge of all the Native wounded (mentioned in despatches, medal with three clasps, and bronze decoration); Maori Expedition as Principal Medical Officer. He was in receipt of a Distinguished Service pension, granted him in 1894. Afterwards he held for some year the now abolished post of Examiner of Medical Accounts in Calcutta, and was afterwards promoted P. M. O. of the Lahore District.

CAPTAIN E. A. C. MATHEWS, I.M.S., was granted leave for one year. Pension service, fifth year, commenced 27th January 1904.

THE services of Captain W. Glen Liston, I.M.S., are transferred from the Government of the Central Provinces to the Home Department, Government of India.

CAPTAIN G. FOWLER, I.M.S., joins the Central Provinces and is posted to Akola as Civil Surgeon. Lieutenant-Colonel E. W. Reilly, I.M.S., is transferred to Amraoti, and Lieutenant-Colonel R. B. Roe, I.M.S., is granted leave.

WE clip the following from an account of the West London Medico-Chirurgical Society's dinner on 4th May:—

"After the usual loyal toasts had been honoured, Colonel T. H. Hendley, I.M.S., in responding to the toast of "The Imperial Forces," which was proposed by Mr. C. R. B. Keetley, referred to the serious misgivings caused by the determination of the authorities to omit from the Army Council the head of the Army Medical Service. If the Medical Service of the army was expected to show successful results in war, there should be full preparation in time of peace, and that could only be secured by continuity of administration and by full representation. The Indian Medical Service had no official representation on the Supreme or Provincial Legislative councils. However, the good sense and courtesy of Lieutenant-Governors and other officials minimised this want of representation in the Indian Medical Service. Few realised, perhaps, in how many ways the men in the Indian Medical Service were in touch with the history and daily work of the empire. Boughton and Hamilton were among the founders of the Indian Empire, and Holwell, the hero of the Black Hole of Calcutta, was for a time Acting Governor of Bengal. Continuing, Colonel Hendley pointed out that two officers, who had recently served under him, were now on special service, one Colonel L. A. Waddell, I.M.S., Medical Officer and Antiquary with the expedition in Tibet, and the other, Major R. Bird, I.M.S., in Cabul on a mission to the Ameer. Colonel Hendley concluded an interesting speech by affirming that such variety of work and responsibility demanded unusually wide powers of control and representation."

THE annual I. M. S. Dinner was held in London at the Café Monico on June 9th, 1904.

WE confess to a considerable sympathy with the following quotation from the *B. M. J.* (May 14th):—

"Doctor Sahib writes: So far as I have been able to find out from actual inquiry among other I. M. S. men, it is only a certain number of senior men who are in favour of the introduction of the station hospital system. The average man continues to hold—what we have always hitherto held—that the existence of the regimental system has been our one great boon, the one thing that has made our social life a happy one and our professional life one worth living. We occupy a definite and comfortable position in military society. As independent units we should be no man's children, and our position as honorary members of the mess could never be the well-assured one it is now; we should always feel we were outsiders. It would be the breaking of a tie between ourselves and the staff corps, to give them their old name, such as binds together no two other branches of His Majesty's service.

As an ideal, the station hospital system, with its seniors ready to instruct and encourage the juniors, is splendid; as the real, with its military discipline always running counter to professional feeling, and its seniors, whose position over the juniors depends in no way on their greater knowledge, the station hospital system is a blight on professional keenness. In this connexion the evidence of others who, like myself, have had a month or two of station hospital work before joining the native army, should be valuable. I joined a regiment; for the first time my patients were my own: I needed to ask no man if I might do this or that, and I shall never forget the stimulus to professional keenness my new sense of responsibility gave me. Military discipline exerted in medical professional matters has a deadening effect on professional keenness, and the happy feature of the regimental system is that the only discipline exerted over the doctor is in purely military matters; his professional self-respect is untouched, and can live. Conversely, the bad feature of the station hospital system is its introduction of that medico-military discipline for his freedom from which the I. M. S. man daily thanks heaven.

I confess I am not greatly impressed by the fact that those who want the change are pretty senior men. The senior man has had more time and leisure to develop the service habit of "grouseing" than the rest—a habit of the existence of which I fancy the Editor of the *British Medical Journal* is fairly well aware.

I do not deny we suffer from disabilities and discomforts. I have been long enough in the service to be aware of them. But some of them are inherent in the position of a military medical officer with native troops, and especially a senior one. It is easy to fall into the fallacy of imagining that the abolition of a particular system would necessarily be the panacea for vaguely-felt discomforts.

If the station hospital system is ever introduced, then shall the sigh of the Indian Medical Service man reach the ear of the long suffering Editor of the Journal—"Oh, for the good old days of the regimental system, when the doctor was 'one of ourselves' in the mess and not the outsider he is now; when he was in touch with the sepoys and knew their ways: and when the regiment was proud of him! He was the 'Doctor Sahib' then. And who is he now?"

THE following Assistant Surgeons in the Madras Command are promoted to Assistant-Surgeons, third class:—

W. H. Meneaud, C. B. Green, H. C. Jackson, A. A. Freud-Hart, G. E. Duckworth, P. T. Duckworth, G. M. Collegan, C. F. T. Carter, A. W. Gernon, J. A. Lemerle.

CAPTAIN A. F. W. KING, I.M.S., is appointed to act as Civil Surgeon of Ratnagiri, *vice* Lieutenant-Colonel K. R. Kirtikar, I.M.S., who is permitted to retire.

AT the close of the Mahableshwar season, Major J. B. Jameson, I.M.S., acts as Deputy Sanitary Commissioner, *vice* Lieutenant-Colonel A. V. Anderson, I.M.S., going on leave.

ON return from duty Lieutenant-Colonel C. F. Willis, M.D., I.M.S., goes to his substantive appointment as Civil Surgeon, Satara.

MAJOR C. J. HUDSON, I.M.S., acts as Civil Surgeon of Bijapur, pending further orders.

ASSISTANT SURGEONS S. G. JACKSON, A. J. Archer, S. G. Alphonso, J. W. Greahy have been awarded Silver Medals for long service and good conduct.

MAJOR N. P. SINHA, I.M.S., recently Civil Surgeon of Rangpore, retired from the service on 1st June.

LIEUTENANT-COLONEL C. F. WILLIS, I.M.S. (Bombay), is permitted to return to duty from furlough.

MILITARY ASSISTANT-SURGEON L. J. O'REILLY, I.S.M.D., was granted six weeks' privilege leave from 6th June.

CIVIL ASSISTANT-SURGEON B. B. GHOSE took charge of the Civil Medical duties of Etah, and Captain T. Hunter, I.M.S., Civil Surgeon of Farrukhabad, was put in visiting medical charge, *vice* Military Assistant-Surgeon O'Reilly.

MAJOR W. B. LANE, I.M.S., Superintendent, Central Jail, Jubbulpore, is granted twenty-two days' privilege leave from 1st July.

MAJOR H. HERBERT, I.M.S., on furlough, read a paper at the Ophthalmological Society, London, on trachomatous pannus and its associated changes, on 5th May.

ON return from furlough Major H. J. Dyson, I.M.S., F.R.C.S., is posted as Civil Surgeon of Bhagalpore.

THE undermentioned Lieutenants of the Indian Medical Service, posted to the Commands noted against their names, reported their arrival at Bombay, on the dates specified :—

William Samuel Jagoe Shaw (*Bombay*)		15th October 1903.
Charles Seymour Parker (*Bengal*)	...	5th March 1904.
Leethem Reynolds (*Punjab*)	...	2nd January 1904.
Harold Holkar Broome (*Punjab*)	...	
Dwarka Prasad Goil (*Bombay*)	...	21st July 1903.

THE following officers are re-appointed Honorary Surgeons to the present Viceroy :—

Surgeon-General Sir B. Franklin, K.C.I.E., Indian Medical Service.
Surgeon-General D. Sinclair, M.D., C.S.I., Indian Medical Service.
Surgeon-General W. F. Burnett, Royal Army Medical Corps.
Colonel S. H. Browne, M.D., C.I.E., Indian Medical Service.
Colonel J. T. B. Bookey, C.B., Indian Medical Service.
Lieutenant-Colonel F. F. Perry, Indian Medical Service.
Lieutenant-Colonel W. G. H. Henderson, Indian Medical Service.

LIEUTENANT-COLONEL J. C. FULLERTON, M.B., I.M.S., has been permitted to retire from the service with effect from 25th June 1904. Lieutenant-Colonel Fullerton has served for many years in Quetta where he had been an Administrative Medical Officer. He was born on 3rd August 1850, entered the service 31st March 1874, and promoted Lieutenant-Colonel 31st March 1894. Of the Bengal men of that year only Colonel S. Haslett Browne, C.I.E., and Colonel G. Bomford, C.I.E., remain in active employ.

MAJOR A. L. DUKE, I.M.S., on return from furlough, was appointed an Agency Surgeon, 1st class, and to act as A.M.O. in Baluchistan.

THIRTEEN appointments in the Indian Medical Service are offered for competition in August, and thirty in R. A. M. C. on 28th July.

WE hear that Major C. H. Bedford, I.M.S., Chemical Examiner to Government, is now in much better health and hopes to be able to return to Calcutta in October next. We will notice in out next issue the second edition of his Clinical Handbook of Urine Analysis. His little book on *Practical Chemistry* has been translated into French and Italian, a fact which shows the high opinion generally entertained of the book.

CAPTAIN S. P. JAMES, I.M.S., who is now on special duty under the Sanitary Commissioner, officiated for some time as Statistical Officer, *vice* Colonel Wilkie, and was sub. *pro tem.* from 2nd to 5th April 1904, till arrival of Major E. Roberts, I.M.S.

THE services of Lieutenant-Colonel W. B. Bannerman, I.M.S., are again placed at the disposal of the Bombay Government.

CAPTAIN A. B. FRY, I.M.S., assumed charge of the Civil Medical duties of Kohat, relieving Lieutenant J. Woods, I.M.S., on 14th May 1904.

HONORARY CAPTAIN J. PRENTIE, I.S.M.D., is appointed to act as Superintendent, Central Jail, Nagpore, during the absence of Captain F. O. N. Mell, I.M.S.

MR. K. K. GOKHLE is appointed Acting Civil Surgeon of Bhandara, Central Provinces, during the absence of Captain J. Prentie.

CAPTAIN W. M. PEARSON, I.M.S., is appointed Officiating Civil Surgeon of Sambalpur.

LIEUTENANT-COLONEL J. H. SWEENY, I.M.S., Civil Surgeon, Benares, was granted one month's privilege leave, and Captain E. J. O'Meara, I.M.S., was sent from Mirzapore to act for him at Benares from 15th June.

CAPTAIN H. A. SMITH, I.M.S., Civil Surgeon of Rae Bareli, was granted privilege leave for one month from 6th June.

LIEUTENANT-COLONEL J. G. PRATT, I.M.S., Civil Surgeon of Lucknow, hold visiting charge of Rae Bareli during the absence of Captain H. A. Smith, I.M.S.

LIEUTENANT-COLONEL J. ANDERSON, I.M.S., having gone on leave, Lieutenant-Colonel G. A. Emerson, I.M.S., officiates as a Civil Surgeon, 1st class.

A list of the Medical Officers with the Tibet Mission Force will appear in our next issue.

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will **receive 25 Reprints gratis**, if requested.

Communications on Editorial Matters, **Articles, Letters and Books for Review** should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscriptions to the Indian Medical Gazette, Rs. 12, *including postage, in India. Rs.* 14, *including postage abroad.*

BOOKS, REPORTS, &c., RECEIVED.

Ophthalmological Anatomy.
Manual of Surgery, Vol. II. Thompson and Miles. (Young J. Pentland.)
Martindale and Westcott's Extra Pharmacopœia. 11th Edition. (H. K. Lewis.)
Major Bedford's Clinical Handbook of Urinary Analysis. 2nd Edition. (London: Bell and Bradfute.)
Kraepelin's Clinical Psychiatry. (Ballière, Tindall & Cox.)
Agricultural Ledgers, 1902, 1 and 2, and Index.
Mineral Waters. (Ingram and Royle.)

ACKNOWLEDGMENTS, COMMUNICATIONS RECEIVED.

Major P. W. O'Gorman, I.M.S., Lahore; Major F. P. Maynard, I.M.S., Darjeeling; Lieut. Davys, I.M.S., Tibet; Col. Waddell, I.M.S., Tibet; Capt. T. B. Kelly, I.M.S., Tibet; Major H. Smith, I.M.S., Jullundar; Major W. E. Jennings, I.M.S., Bombay; Major E. Jennings, I.M.S., Bareilly; Major E. Roberts, Simla; Capt. Rait, I.M.S., Chapra; Major E. O. Thurston, I.M.S., Calcutta; Lieut. Fleming-Barnardo, I.M.S., Somaliland; Capt. Haywood, Purnea; Capt. E. Waters, I.M.S., Puri; Major D. M. Moir, Calcutta; Messrs. Saunders & Co., London; Messrs. Burroughs, Wellcome & Co., Calcutta; Dr. Ross, Calcutta.

Original Articles.

CLINICAL NOTE ON A CASE OF MALIGNANT DERMOID CYST OF THE NECK.

By D. M. MOIR, M.D.,

MAJOR, I.M.S.

WITH PATHOLOGICAL REPORT AND PATHOLOGICAL COMMENT.

By CLAYTON LANE, M. D.,

CAPTAIN, I.M.S.

P. a Hindu male, aged 40, a cultivator from the Central Provinces, was admitted to the Medical College Hospital, Calcutta, for a cystic growth on the right side of his neck.

Previous History—His statement is that he scratched the side of his neck one night about three months ago because it was itching. Next day he observed a swelling in that situation the size of a walnut, and it has steadily increased in size ever since. A fortnight later the actual cautery was applied to his neck by a kabiraj, and during the next six weeks he tried various drugs without effect. At the end of two months he left his home and went to the Sambalpur hospital, where the swelling on his neck was thrice tapped by the Civil Surgeon. On each occasion a milk-white fluid was drawn off, and rapidly accumulated again in the course of a few days. After a month at Sambulpur he came here.

Condition on admission.—A middle-aged weakly and emaciated man, with a large tumour covering the whole of the right side and front of his neck, and overlapping his chest to the level of the second rib, practically hiding three-fourths of

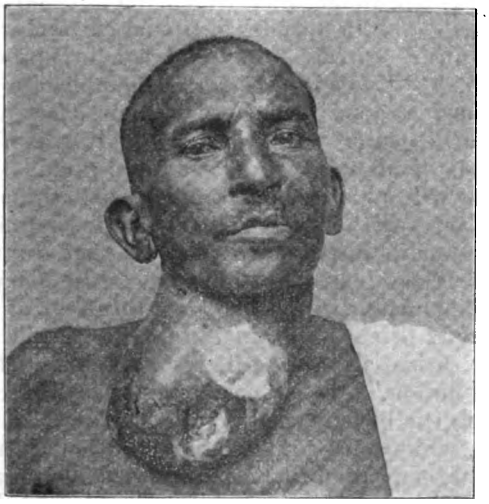


Fig. 1.

the clavicle (*vide* Fig. 1). At first *sight* the impression produced was that of an inoperable sarcoma of the neck, the skin over the growth appearing discoloured, adherent and scarred in places.

On palpation one perceived the thrill of a sac full of fluid, the mass was fairly moveable on its deep connections, though adherent anteriorly to the skin in places. With a hypodermic syringe a little fluid was removed. This proved to be turbid and blood-tinged, but the microscope gave no definite results.

Careful examination of the mouth and nasopharynx yielded no evidence of a primary growth. Particular attention was paid to this matter, because such a growth was discovered in the pharynx in a somewhat similar case in the same wards a few months previously.

Operation on the 27th August.—The incision extended from the mastoid process to the inner end of the clavicle, leaving an elliptical piece of skin attached to the tumour, as is usually done in excision of the breast. An attempt was made to dissect out the sac entire, but this proved futile, partly owing to the adhesions and partly owing to the friable condition of the cyst walls. The sternal portion of the sterno-mastoid had to go with the cyst wall. It was not till the floor of the anterior triangle in its upper part was reached that there was any evidence of tumour growth, and here it involved the carotid sheath and dipped down along the lines of least resistance to the middle constrictor, levator anguli scapulæ and splenius. The tumour tissue resembled ordinary sarcoma tissue, and as much as was feasible was removed. Of course there was considerable hæmorrhage, but after the wound was thoroughly dry it was closed entirely, save for a small opening at the sterno-clavicular end for a gauze drain.

2nd September.—First dressing on the seventh day. Incision healed except where the gauze plug lay. The patient left the hospital a few days later against advice, as he considered himself cured.

Pathological Report.

To the naked eye the cyst was lined internally by a number of papillæ, definitely cauliflower in appearance, recalling in the most marked way that of the cauliflower epithelioma of the vaginal surface of the cervix uteri; that is, the papillæ were fine-stalked, branching and of a striking delicacy, so that they could only persist entire and unbroken in some place where they were protected from friction. There was no shredding nor other evidence of necrosis.

Under a magnification of five diameters the very delicate branching nature of the papillæ is well shown (Fig. 2), and in addition the fact that there is a regular epithelial sheath on the papillæ enclosing an axial stroma.

Under a magnification of 50 diameters the epithelium is seen to form a regular and unbroken covering to the papillæ. It is stratified, there being a deep layer of columnar cells lying on the dermic stroma, and above this 8 to 10

layers of cubical cells, while those on the surface are flattened. There is no cornification of the superficial layers, the straining being the same throughout the whole depth of the epithelium. The stroma of the papillæ is plentifully supplied with cells, many of them with elongated nuclei, and there is a fibrous matrix between. There is much indipping of the epithelium into the papillæ so that the stroma is minutely broken up by the invading columns.

In the deeper parts (Fig. 3) there is invasion of the wall of the cyst by columns of epithelial cells. These columns have a much wider diameter than have those invading the papillæ, so much so that their central parts have become necrotic, showing a granular basis with a few nuclei, some of these being elongated, some round, some polymorphic. The stroma of these deep parts is in places the seat of a cellular infiltration, the nuclei of these cells being round. The epithelial columns can be seen cut off at the deep surface of the part removed, so that they have evidently, as was noted clinically, passed on to invade adjacent parts.

Under a magnification of 240 diameters, the appearances just noted are confirmed. In the deeper part of the cyst wall the round nuclear infiltration is seen to be in part at least situated along the course of small blood vessels, and therefore due to the exudation from them of mononuclear white blood corpuscles. This infiltration is on the whole quite insignificant. It can at no point be said that the stroma is invaded by single detached epithelial cells, although there are one or two points where a process consisting of a few cells projects from an epithelial column into the stroma. Under a magnification of 530 diameters the number of mitotic figures visible in the epithelial cells is most striking. It is difficult to convey an adequate idea of the extent to which this condition is present. This may perhaps best be attempted by stating that an actual enumeration of one thousand contiguous cells of one of the deeper epithelial columns shows that twenty eight cells or 2·8% exhibit one phase or another of mitosis, that is each field under the immersion lens shows 5 or 6 of these figures. A little search through one section has enabled the illustration of the whole series of changes accompanying mitotic division; indeed the difficulty has been, not to find cells illustrating the various phases, but to choose those most suitable for drawing. These are well illustrated in Fig. 4 (*a* to *h*) the collection of the chromatin into a loose and a dense rosette; its division into two halves having the appearance of two linear bars with the subsequent division of the cytoplasm into two cells; the conversion of the bars into rosettes as the new cells retreat from one another; and the passage of the rosettes, through a phase of loose aggregation, into the ordinary nuclear network. There are also a considerable number of cells with giant nuclei (Fig. 4, *i*) as if the growth of nucleus had been so rapid as to outstrip its dividing power. "Cancer bodies" are also to be seen scattered about the section (Fig. 4 *k*) in the epithelial cells.

The figures illustrating the pathological changes have all been painted by Babu B. L. Dass, the Medical College Artist, by the aid of the camera lucida; he is to be congratulated on the accurate way in which he has reproduced the actual state of affairs. The difference in the magnification stated in the text and in the figure is dependent on the fact that the drawings were made, not at the level of the stage on which the section lay, but at that of the table, thus entailing, in the case of the microscope used, a magnification of about half as much again.

Pathological Comment.

It may be said at once that, for reasons to be presently stated, the tumour is considered to be a persistent branchial cleft, the epithelium of which has undergone carcinomatous change. To the possibility of such a tubulo-dermoid undergoing this change there are scant references in most of the text-books available here for reference. The majority of them do not mention the subject.[1] Ohlmacher[2] says:—"Most teratomas" (among which he includes dermoids) "grow slowly, but some of them increase rapidly in size, even rivalling sarcoma and carcinoma; these rapidly growing teratoid neo-plasms show other evidences of malignancy, like growing along contiguous surfaces, recurrence after removal, and even by metastasis, whereby new tumours, with a portion or all the structural peculiarity of the original, spring into existence in remote localites." In the same work Beyea says of dermoid cysts of the ovary:—"Rarely there occurs through rupture a dermoid implantation metastasis to the peritoneum. Adenocarcinoma and squamous epithelioma may occur." Bland Sutton[3] goes into the matter very fully. He says:—"One of the facts connected with epithelioma of the mouth is the extraordinary size which the infected lymphatic glands in the neck sometimes attain, whilst the ulcer scarcely exceeds 1 cm. in diameter. * * * * It is necessary to emphasise this, because a good deal has been written about 'branchiogenous cancer' or, as it is sometimes called, 'malignant cyst of the neck.' ..... Some writers are of the opinion that these are primary epitheliomata arising in remnants of branchial clefts. My belief is that in most cases these gland masses are secondary to epitheliomata originating in recesses of the pharynx or naso-pharynx, and the theory that they arise in remnants of branchial clefts is pure fiction." He of course admits that cysts due to the blocking of a branchial cleft at both ends, while some intermediate portion remains patent, may occur; and describes their lining as being either of squamous or ciliated epithelium

[1] Green, Pepper, Coates, Zeigler, Hamilton, Payne.
[2] Hektoin and Reisman's Pathology.
[3] Tumors, Innocent and Malignant.

FIG. II.

MICROSCOPIC SECTION OF MALIGNANT DERMOID CYST × 5.

It shows the delicate branching nature of the papillæ and the invasion by columns of cells of the surrounding stroma. The red circle is the part from which fig. 3 is taken.

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FIG. III.

MICROSCOPIC SECTION OF MALIGNANT DERMOID CYST × 75.

Large epithelial columns invading the stroma, the largest columns having necrotic centres. The fine lines of cellular infiltration lie along small blood-vessels and appear to be a commencing leucocytic infiltration from these. The dumb-bell shaped body, from which this infiltration runs, is a small artery in cross section.

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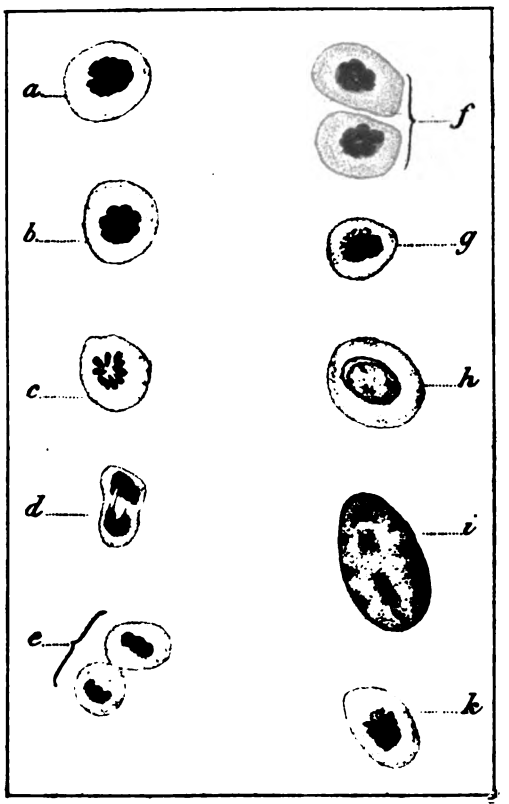
FIG. IV.

EPITHELIAL CELLS FROM INVADING COLUMNS OF THE SECTION ILLUSTRATED IN FIG. II × 800.



a to h. A series of cells showing the various mitotic changes.
a. Nuclear chromatin collected into a loose rosette.
b. Nuclear chromatin in a dense rosette.
c. Nuclear chromatin begining to divide into 2 bar-shaped halves.
d. Nucleus has nearly divided, the bars of chromatin being still joined by fine chromatin-bearing strands. The cytoplasm has not yet divided.
e. The cytoplasm has divided; there are two cells each with a bar-shaped nucleus.
f. The nuclei of the daughter cells are in the form of dense rosettes.
g. One of a pair of cells in which the chromatin-bearing fibres are becoming loosely arranged with a tendency to form v's. The second cell was not on the same plane but overlying the first and has not been illustrated.
h. A normal epithelial cell not undergoing mitosis. The chromatin is mostly collected round the periphery of the nucleus, there being also a faint loose network within it.
i. A giant nucleus; the limits of the cytoplasm could not be distinguished.
k. A cell with the nuclear chromatin collected into a dense rosette. There is a cancer body in the cytoplasm.

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according as the cyst is developed from the outer or inner part of the cleft. He recurs to the question of the malignancy of dermoids in connection with the subject of ovarian dermoids, in those cases in which after the rupture of one of these cysts into the peritoneal cavity there are formed numerous secondary cysts, analogous to implantation cysts, and he says "It is a matter of great interest, because it completely disposes of the view that dermoids may exhibit malignant characters and give rise to secondary deposits." This will depend on what one means exactly by the term 'malignant characters'. The formation of secondary cysts after the intraperitoneal rupture of a dermoid may at once be classed as an instance of implantation; but the question of the possibility of the epithelium lining a tubulo-dermoid of the neck, or indeed of any other dermoid, taking on carcinomatous characters is quite another matter, and the one does not exclude the other. There does not appear, *primâ facie*, any reason to suppose that the epithelium of a dermoid cyst should be exempt from a change which may take place in precisely similar epithelium elsewhere, including that from which the dermoid itself has sprung.

The evidence for or against the question of the primary or secondary character of these cysts, is of the following nature.

Treves[4] describes three such cysts. The first was left-sided in a man aged 53, attained the size of a goose's egg in eight weeks, clinically resembled a chronic abscess, was tapped and finally laid open. Later hæmorrhage occurred from it, and diarrhœa setting in, the man died of exhaustion 17 weeks after the swelling was first noticed. After death microscopic section of the wall of the cyst showed the structure of carcinoma undergoing mucoid or colloid change. No mention is made of the nature of the structures immediately lining the cavity. No evidence of another primary growth appears to have been found. The left lobe of the thyroid was atrophied but not involved in the growth. Treves continues—"The smooth and distinct lining wall of the cyst is a little difficult to explain. The mucoid matter which had escaped from the cyst did not occupy the centre of a broken-down mass. It was clear and free from *débris*, and after its evacuation a simple cyst wall remained."

The second case in a woman, aged 52, presented a large tumour on the right side of the neck, more solid than cystic, and fairly fixed. It was six months old. On being dissected out the tumour was encapsuled superficially but infiltrated the deeper parts. She died of exhaustion three days after the operation. No autopsy was allowed. The contents of the cyst and the histological characters of the wall were as in the first case, except that the carcinomatous alveoli were longer and narrower; there was the same colloid or mucoid degeneration, and the same wasting of the lateral lobe of the thyroid gland; the lining wall of the cyst was smoother and the mucoid matter it contained unmixed with *débris*.

In the third case the right side of the tongue had been removed for epithelioma 14 months earlier, together with some glands on the right side of the neck. The operation scars were quite sound and there was no more glandular enlargement on the right side, but under the upper end of the left sternomastoid was a soft swelling, which contained three ounces of clear yellow fluid. When laid open the lining was smooth except for a cauliflower mass an inch square at one spot. After the operation there ensued rigors and wasting, and death from bleeding 22 days later. "The tissue of the cyst was the tissue of an epithelioma; between the cylinders and masses of epithelium there was a fair amount of small cell growth. There were the usual epithelial 'nests.'"

Treves then refers to three other cases. The first was by Dr. Seymour Sharkey[5] describing 3 cystic subcutaneous epitheliomata present simultaneously in the same individual, two on the head and one on the umbilicus; they had not grown from the skin, and were apparently primary and independent of one another. They proved to be squamous epitheliomata, and on being cut into gave exit to a thick brownish fluid containing innumerable cells and many cell nests. Like cystic tumours were found in the liver and other organs.

The second case was by Mr. Godlee.[6] There were numerous tumours, secondary to an epithelioma of the left side of the tongue, all of which were cystic. Treves's comment is "Mr. Godlee's case bears a very near resemblance to the one I have described. In my case the cyst wall was a little too precise to suggest that the cavity was due to the breaking down of the new growth."

The third case was by Dr. Morell Mackenzie,[7] a cyst of the left side of the neck secondary to epithelioma of the right side of the epiglottis; it was not examined microscopically.

Treves mentions two more cases reported by Lebert[8]; in one of these there was cancer of the gullet, and enlarged glands in the neck, the largest of which were cystic; in the other there was epithelioma of the lower lip and jaw, with many enlarged glands in the neck, three of which were cystic.

A. Quarry Silcock[9] describes three more cases.

The first was in a man aged 32; it was of less than three months' duration, and lay under the lower part of the left sterno-mastoid. It was first lanced and then scraped, and the man lived nearly a year after the first appearance of the growth. *Post-mortem* it presented a cystic cavity lined by large papillary or cauliflower-

[4] Malignant cysts of the neck. Transactions of the Pathological Society, vol xxxviii, 1887, p. 366.

[5] Transactions of the Path. Soc., vol. xxxv, 1884, p. 374.
[6] Trans. of the Path. Soc., vol. xxxii, 1881, p. 37.
[7] Trans of the Path. Soc., vol. xix, p. 61.
[8] Mem. de la Soc. de Chir. de Paris, 1852.
[9] Trans. of the Path. Soc., vol. xxxviii, 1887, p. 374.

like granulations, many of which were the size of a filbert or larger. Microscopically these papillary growths consisted almost entirely of epithelium cells, the most developed of which were evidently of the squamous type but not prickled, forming well-marked nests, while long columns of like cells radiated into and formed the mass of the tumour.

The second case reached the size of a cricket ball in five months, lay on the right side of the neck, was incised with the emission of a glairy yellow fluid. The wall of the cavity resembled that of the first case. At the *post-mortem* examination six weeks later " the naked eye and microscopic appearances were identical with those described in the last case." The third case was in a man aged 64, involved the whole of the left side of the neck, and had the skin over it reddened. On tapping there was drawn off thick yellowish grumous fluid, in which, on microscopic examination, large numbers of epithelium cells were seen.

In none of the cases was there any suspicion or evidence of a growth or growths besides that in the neck, although such was carefully looked for.

Charles J. Symonds [10] describes a case of cystic growth in the neck in which great care was taken to exclude primary growth in the mouth, pharynx and larynx. The cyst was excised and " showed all the characters of squamous epithelioma, and resembled in structure exactly the case recorded by Mr. Treves."

Some of these cysts are obviously secondary growths, but in other instances this cannot be proved, nor again can it be proved that they are primary, and this in its turn is to great extent due to the fact that no description is furnished of the layer of tissue immediately lining the cyst cavity. It is a point which will bear considerable insistence, that in deciding whether the cystic condition of a given tumour is the result of the breaking down of a secondary cancerous nodule, or is the primary state of an embryological structure, the arrangement of the tissue forming the immediate lining of the cavity is all-important. Should the cavity be lined by a regular epithelium of a recognised type, such as one finds lining the cavity of one of the hollow viscera, then the inevitable conclusion is that the cyst was at some period of the development of the individual an out-growth from such a viscus. If on the other hand the immediate wall of the cyst is lined partly by epithelial columns and partly by stroma it does not appear that the contrary conclusion can be drawn; for the irregular distribution might be due to the breaking down either of a secondary cancerous gland, or of a primary cancer occurring in the originally non-malignant epithelium of a simple cyst.

The evidence reviewed so far tends to confirm Bland Sutton's belief that in most cases these tumours " are secondary to epitheliomata originating in the pharynx or naso-pharynx " [and one may add the œsophagus]; but this is very different to his subsequent conclusion, that evidence of transplantation completely disposes of the view that dermoids may exhibit malignant characters. That vestigial structures may undergo malignant change the following reports show.

H. Morley Fletcher and H. J. Waring[11] have given a description of a malignant sacro-coccygeal cyst. It lay between the rectum and coccyx, and did not involve the skin, had been present since birth, was increasing in size, and was removed with the coccyx. It had pushed the rectum forward but had not involved it. It recurred in 2 months and the child died a month and half later. On examination, the tumour was partly cystic and partly solid; the former portion multilocular and lined by a columnar epithelium set in a vascular stroma, which in places had undergone myxomatous change; the latter showing the structure of adeno-carcinoma. The recurrence in the pelvic glands was adenocarcinomatous. The growth had no connection with the rectum, which was not diseased. In discussing the origin of this tumour the authors reject the coccygeal gland, the neurenteric canal, and the fœtal inclusion of a dermoid cyst as possible sources, and favour the supposition of its origin from the post-anal canal; firstly on account of its anatomical position corresponding with that of this vestige, and secondly because of the close resemblance of the minute structure to that of carcinomatous growth of the rectum.

It is noteworthy that all the possible sources put forward by the authors are fœtal vestiges; and indeed no other explanation is reasonable. There is here, then, a growth springing almost certainly from a fœtal vestige, and which has become malignant. If this change may occur in a fœtal remnant connected with one end of the alimentary canal, there is every reason to suppose that it may equally do so in the case of such a remnant situated at the other end. It is to be noted that the fœtal remnant, in the instance just quoted, is hypo-blastic.

Compare with this a second coccygeal tumour described in the same paper. It was congenital, the child dying at seven days. It formed a mass three inches in diameter lying between the sacrum and coccyx behind and the rectum in front. On examination it proved to be made up of a number of cysts lined for the most part by columnar epithelium, and with numerous intra-cystic growths—an aleno-carcinoma. In some places, however, there was a stratified epithelium. The stroma was of embryonal connective tissue with islets of cartilage. They consider that the tumour sprang from the neurenteric canal; the columnar lined portion from the hypoblastic part, and the stratified portion from the epiblastically derived central nervous system.

[10] Trans. of the Path. Soc., vol. xxxix, 1888, p. 337.

[11] Trans. of the Path. Soc., vol. li, 1900.

Had the epiblastic portion become malignant, it would probably have had a structure much like that of the case now reported.

Here then are good grounds for supposing that vestigial embryonic structures derived from hypoblast may undergo cancerous change. If this be granted, it is irrational to deny the possibility of the same change occurring in such structures when they are derived from epiblast.

Having established this possibility, it is necessary to consider what evidence the cyst itself offers of its origin and nature.

The questions to be decided before admitting this case to be one of epitheliomatous change in a dermoid cyst are these:—Can the cyst possibly be due to the breaking down of glands affected secondarily from some undiscovered cancer in the recesses of the pharynx or nose? If this be answered in the negative and the cyst is a tubulo-dermoid, has its epithelium become cancerous?

The very fact that the most careful search for such a primary nasal or pharyngeal cancer failed to reveal the presence of any such lesion is strong evidence that no such primary growth existed, for the cyst is lined by a stratified epithelium, and (if metastatic) the sites in mouth and pharynx lined by a stratified epithelium, and consequently the only ones (with the exception of the œsophagus) from which a primary growth giving rise to such a metastasis could take origin are nearly all quite easily accessible for, and allow of, accurate observation. Then too the symptoms do not correspond with those given by Bland Sutton[18] as characterising the enlargement of the cervical glands secondary to epithelioma of the mouth and pharynx. He says of this condition:—"The tumour is most commonly observed after the age of 50, and is deeply situated in the neck, usually near the fork of the carotid. It grows with great rapidity, and in many cases softens in the centre and gives rise to fluctuation. The overlying skin becomes brawny and the resemblance to an abscess is striking." The situation might be the same and fluctuation would of course be present in either case, but the age and simulation of abscess are different. Treves' recent description of the symptoms of these cysts is practically the same.[19]

It is moreover quite certain, from the conditions described and pictured, that the cyst did not have its origin in this way. It does not show the structure of a necrotic epithelioma, the confused jumble of granulation tissue and epithelial columns partly keratinised which would be found lining such a cavity. It is on the contrary lined by an unbroken stratified epithelium, set with striking regularity on a fibrous stroma, the whole forming a typical mucosa raised into a number of branching papillæ of extreme delicacy, and of characteristic structure. In this position such a mucosa could scarcely be furnished by any structure other than a tubulo-dermoid formed by the imperfect closure of the epiblastic portion of a branchial cleft. It may be granted then that the tumour could not have been formed by the breaking down of metastatic epitheliomatous glands, but that it is a tubulo-dermoid of the neck. The matter of its malignancy remains to be considered. Clinically the tumour was found at the operation to be extensively infiltrating the surrounding parts, so that it was thought that it might be a sarcoma. It had the clinical character then of a malignant tumour. Under the microscope, as is well shown in the painting, the epithelium lining the wall of the cyst dips down in columns into the surrounding stroma, the columns of cells extending evidently beyond the limits of the portion of wall excised. Some of the columns of cells are so large that the central parts, being imperfectly nourished by plasma from the surrounding vessels in the stroma, have undergone necrosis. Such epithelial invasion of the underlying connective tissue is the essential change constituting a carcinoma. There are no typical cell nests with central keratinisation, nor is this to be expected, seeing that there is no keratin formation in the epithelial cells covering the papillæ. The part of the painting showing these invading columns might almost have been copied from an illustration of medullary carcinoma of the breast found at page 1008 of Hektoen and Reisman's Pathology. Their peculiar character is explicable on the assumption that they spring from the epithelium of a tubulo-dermoid, which is itself peculiar in position and nature, being modified in structure as compared with that of the mucous membrane from which it originally grew, just as that of the breast is modified from that of the skin glands of which it is a development.

One of the most convincing evidences of malignancy is the presence of the enormous number of mitotic figures, a phenomenon indicative of extremely rapid cell division, and inferentially of a high degree of local malignancy. The amount of mitosis is very much greater than in a scirrhus cancer of the breast with metastases in the axillary lymphatic glands, which came for report about the same time.

There can be little question then that the evidence, clinical and pathological, points to the following conclusions:—The cyst is not the result of the softening of a metastatic deposit in the cervical glands secondary to an epitheliomatous growth in the mouth or naso-pharynx; it is on the contrary due to the distension of a tubulo-dermoid resulting from the imperfect closure of one of the branchial clefts (probably the third), the lining epithelium of which has subsequently undergone carcinomatous change.

[18] Tumours Innocent and Malignant,
[19] System of Surgery.

BACTERIOLOGY OF PARANGI (Yaws).

By EUGENE ELLIS MODDER, L.F.P. AND S., G.L.M.,

Assistant Colonial Surgeon, Ratnapura, Ceylon.

VARIOUS writers on Yaws who have made a bacteriological study of the disease have written on the subject. Pieresz so long ago as 1890 spoke of the existence of a micrococcus in the Yaws tubercle. Nicholls in his report on Yaws in Tobago, Grenada, St. Vincent, St. Lucia and the Leeward Islands addressed to Her Majesty's Secretary of State for the Colonies in 1895 states that he found a micrococcus constantly present in the granulomata which he considered characteristic of Yaws. Powell in 1896 noticed in two cultivations a certain yeast whose cells lay in the granulomata.

Dr. J. M. H. Macleod, Assistant to the Dermatological Department, Charing Cross Hospital Medical School, in the Section on the Dermatological Department, British Medical Association, makes the following observation "a search for a specific microbe in the section proved futile. An examination for new micro-organisms in the section of tissues is unsatisfactory at any time and in the skin this is even more markedly the case. We had no difficulty in finding micro-organisms in the horny layer in a number of sections which we stained in diverse ways for the purpose, but we found types we could not distinguish in their appearance from those which occur in the normal epidermis such as cocci, diplococci, sarcinise and a few short bacilli, we failed to find the yeast fungus of Powell, and without cultivation experiments were unfortunately unable to verify the frambœsiform bacillus of Breda or the Micrococcus of Nicholls."

The Parangi Disease of Ceylon, the Yaws of the West Indies, the Brazilian Frambœsia of Professor Breda, I think, are identical diseases, and I hope a few observations which I have made in Ceylon may be of use to my professional brethren elsewhere. I have made a series of cultivations from the secretions of the tubercles of Parangi and in every case succeeded in growing a micrococcus which I succeeded in cultivating in neutral gelatine up to the third generation. The growth was rendered diffluent on the surface and afterwards formed a greyish film. In sterilized broth the growth became turbid and the cocci well marked. In making these observations I notice that the micrococcus could only be grown in acid media and whenever the reaction was alkaline the growth ceased. It occurred to me that the baccillus of parangi having failed to grow in alkaline media of trying alkalies to some of the granulomata, and in a very short time I was convinced of its usefulness. The experiment was tried, and in every instance the granulomata disappeared. A few examples I beg to furnish which will prove my contention. I have not been successful in transmitting the disease to chickens, dogs and even calves, although every possible care and precaution was taken by me in my experiments.

THE statement which I annex will shew the observations which I made concisely.

Case I.—Lappava, a boy of the cultivator caste, born at Hettipoila, where he spent most of his time. Contracted a sore on the left leg when working in a field. It continued for six months, followed by an attack of fever, when the whole body was covered with a pustular eruption. On admission, 12th January, the granulomata were found most prominent about the flexures, face and trunk. Patient was put on soda bicarb. grs. 20 three times a day and a lotion of soda bicarb. grs. 10 to oz. 1 locally. 30th March left hospital perfectly cured.

Case II.—H. L. A., a boy, aged 14, contracted a sore on his leg by a scratch with a piece of broken bottle. Three months after developed a pustular eruption, some of the pustules were as large as a 10 cents piece. The whole body was covered with the eruption. Put on soda lotion and powders; three months after every trace of the disease disappeared, was regularly seen for two years after, he never had so much as a trace of the disease.

Case III.—Malia, a boy, aged 14, contracted a sore on his left foot at root of great toe by a leech bite, treated with ordinary medicines by native medical men till 2½ months ago when a vesicular eruption appeared which gradually became pustular and covered the whole face, armpits, groins and genitals, and a number of them appeared round the margin of the arms and a regular ring formed round the mouth. He was placed on alkaline treatment. In six weeks every trace of the eruption disappeared. He was placed for a further period of six weeks under observation and left the hospital cured. He was again seen after two years, without a trace of the disease.

Case IV.—Muttusamy, aged 35, was by occupation a cooly in the irrigation works, contracted a sore in his leg when working in a paddyfield. The eruption appeared 2½ months after the sore. The whole body was covered with pustules some of them were ulcerating. The secretion was rather profuse and irritating. He was getting feverish in the evening. He was placed on alkaline treatment with generous diet. A month after the treatment was started there was an improvement in his general condition, the scabs began to drop off and the granulomata to disappear. In 14 weeks the eruption had disappeared, and there were only pigmental scars left in their places. A further course of treatment for another month and the patient left the hospital. He was asked to shew himself regularly and to make sure that there was no relapse.

Case V.—Ukku, a fairly well nourished woman, aged 30, when nursing her child with parangi, contracted a sore on her breast. It ran its usual course, and was followed by a pustular eruption

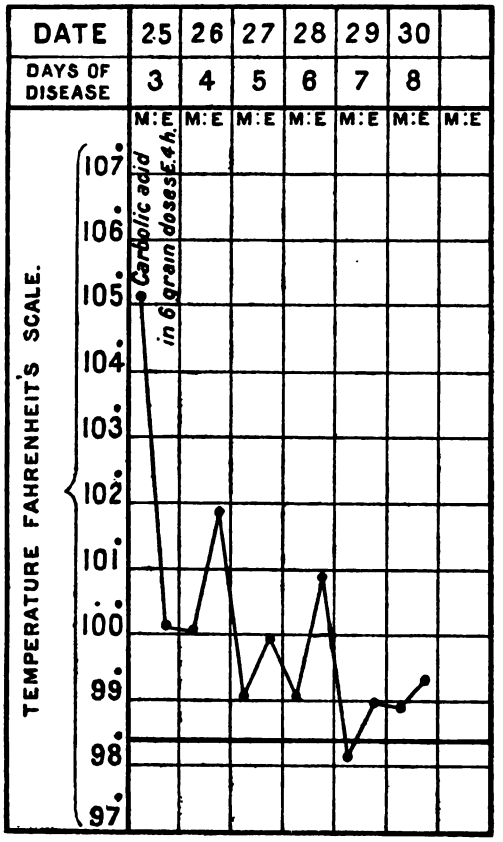
"CARBOLIC ACID TREATMENT OF PLAGUE."

BY MIR HIDAYATULLAH, I.M.S.,

Assistant-Surgeon, Jhelam.

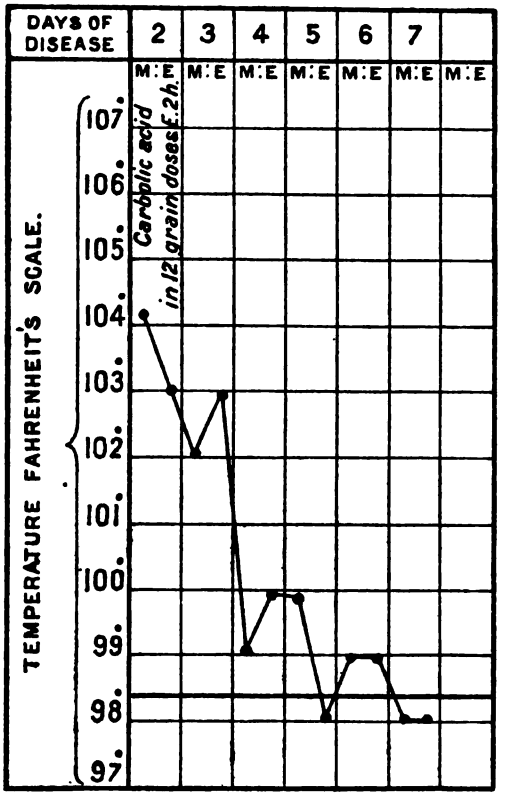
CASE XI.

BUBONIC PLAGUE—*Biwi.*



CASE XIV.

BUBONIC PLAGUE—*Rasul.*



covering the whole body. The infant in arms had a tubercle on the lower lip, which part came in contract with the breast, from which most probably the secretions came in contact with the sore. Both mother and child subjected to the treatment. The child was the first to shew signs of improvement. In the course of 14 weeks every trace of the disease had disappeared. The initial sore in the case of the infant was found in the margin of the prepuce and was brought on by coming in contact with the body of the sister who had the disease.

"CARBOLIC ACID TREATMENT OF PLAGUE."

By MIR HIDAYATULLAH,

L.M. and S.,

Assistant-Surgeon, Jhelam.

Of the various medicines which have been brought to the notice of the profession though none can be called a 'Specific' yet carbolic acid given in large doses and in the commencement of the disease has proved very useful. The medicine was tried here (Jhelam) and the encouraging results I obtained, and the percentage of cures I was fortunate enough to get, make me write these few lines.

The medicine was given in 12 grain doses* every 2nd hour to adults and in smaller doses to children. It was given dissolved in water and sweetened with syrup of Sandal wood (Sherbat Sandal as it is called by native *hakims*), and coloured with little tincture of cardamom. The pink colour given to the mixture made people name it "Golabi mixture," *i.e*, Pink mixture. I gave it well diluted and advised my patients to drink lots of diuretic cooling drinks, especially the water of water-melon and ordinary melon seeds ground in a mortar and mixed with water. Giving the mixture with these medicines made it cooling, which fact was very refreshing to the patients and the confidence of the friends of the sick was gained; at the outset a calomel and podophylin purge was administered. Cardiac tonics as digitalis, strychine and rum were given when required, especially in old and weak.

In favourable cases the first effect of the 'acid' was noticed within 1st forty-eight hours. The temperature fell rather suddenly several degrees and within five days of the commencement of treatment it came down to normal. I append temperature charts of two cases (Cases XI and XIV). They show the usual type of temperature under the carbolic treatment.

All the cases treated were of average severity, some very serious and all patients were treated in their homes.

Of the 18 cases treated of which I have the notes (and all the cases treated were properly observed) twelve were cured, giving 66% as the percentage of success, six died—17 were bubonic cases, one was septicæmic; of those who died, five cases were bubonic and one septicæmic. In only two out of the 18 cases carboluria was discovered, which disappeared on reducing the dose of medicine and giving diuretics, especially the vegetable fruit juices; of the total 17 cases in 3 cases buboes suppurated.

To sum up what I have said before:—

(1) Carbolic acid given in large doses, well diluted and in the beginning of the disease has a beneficial effect on bubonic plague cases.

(2) The temperature comes down in favourable cases within first forty-eight hours, after the drug is administered.

(3) Carboluria is rare.

(4) Resolution of glandular swelling generally take place. Some cases also suppurate.

(5) Septicæmic cases are not much influenced by the drug.

In the end I may remark that the treatment helped us to a considerable extent in finding out the cases and the aversion of people to get themselves treated by doctors was greatly removed.

* The dose seems enormous. Martindale and Westcott (11th Edition) give 1 to 3 grains.—Ed., *I. M. G.*

A Mirror of Hospital Practice.

EXTRA-UTERINE (TUBO-ABDOMINAL) GESTATION, THE FALLOPIAN TUBE SHOWING AN ACCESSORY OSTIUM AND A DIVERTICULUM.

By R. F. STANDAGE,

CAPTAIN, I.M.S.,

Residency Surgeon, Bangalore.

Mrs. S., Eurasian, age 25, was admitted into the Lady Curzon Hospital on 1st February 1904, complaining of metrorrhagia and abdominal pain. She was married in 1900, and had one child three years ago, since which she had not been pregnant. Menstruation commenced at fourteen years of age, and since her confinement in 1901 was quite regular and normal, lasting seven days, till the period which should have occurred between 27th October and 3rd November 1903. This period was suppressed, and patient "feared she had become pregnant again." On 29th November, five days later than her November period was due, bleeding began again, and was continuous till her admission into hospital. The discharge of blood was occasionally very slight, but was noticeably increased about the time when she would expect her menstrual period. The blood was dark in colour, and once, a few days before admission, was passed in the form of small clots. It contained no shreds, and had no odour.

The patient complained of tenderness all over the lower part of the abdomen. She stated that she had never had any sudden, severe attack of abdominal pain, but suffered from more or less severe "grinding" pain on the right side ever since the bleeding began. She was well nourished, but looked pale and ill.

Examination *per vaginam* was exceedingly painful, so it was conducted under chloroform. The uterus was normal in size and position, but the os and vaginal mucous membrane were congested. Blood escaped freely from the os, which was not patulous. The mobility of the uterus was distinctly diminished. A sound passed the normal distance.

A rounded fixed tumour, about the size of a hen's egg, giving a sense of elasticity on bimanual examination, was felt posteriorly and to the right of the uterus, and the whole right posterior quarter gave an abnormal sense of fulness and resistance. The tube or ovary could not be palpated on the right side, but the left ovary was felt fixed low down with considerable surrounding thickening. The breasts were flaccid, but a drop of milk could be expressed from each. Pure carbolic acid was applied to the interior of the uterus and the patient was sent back to bed.

After the examination the patient complained of severe pain in the lower abdomen and the bleeding continued, but had a tendency to decrease in quantity, until, on February 14th only the slightest stain was noticeable on the diapers. The swelling to the right of the uterus, however, increased very decidedly in size, and was very tender. The grinding pain continued, but was less severe. The milk in the breasts did not increase in quantity. Between the 14th, February and the 17th the pelvic tumour enlarged much more rapidly, and extended to the back of the uterus, filling Douglas' pouch. The patient at this time made a statement that her confinement in 1901 was a very bad one and that she had a dread of becoming pregnant. She therefore "took medicine" in November when her course did not come on, and this she thought, caused the discharge of blood which continued ever since.

The patient was evidently not getting better, she was decidedly paler and weaker than on admission, and her friends were very anxious. It was decided that she was suffering from intra-abdominal hæmorrhage, the result of an abnormal gestation, either tubal or tubo-abdominal. An operation was advised and agreed to and was performed on 17th February.

Under chloroform a median incision about 3½ inches long was made below the umbilicus, and the pelvis was explored. The right tube was enclosed in a mass of recent adhesions. On freeing these a quantity of loose blood clot was turned out from Douglas' pouch and from around the outer end of the right tube. This blood clot was most abundant round what appeared to be a rupture of the superior wall of the tube. The clot was enclosed in a sac of loose adhesions, which separated it from the general peritoneal cavity. The tube itself was thickened and was adherent to the posterior wall of the broad ligament, and some time was spent in freeing it. It was eventually brought outside the abdomen, ligatured close to the uterus, and amputated. The right ovary was separately ligatured and removed. The left ovary and tube were freed from some loose adhesions and examined. The fimbria of the tube were thickened, and the ovary showed one small follicular cyst. Both were returned into the pelvis. Great care was taken to clear the pelvis of all clots, and the cavity was irrigated with warm, weak boric solution. The wound was closed by interrupted sutures of silkworm gut, embracing all the abdominal parietes, but not piercing the peritoneum. Miss Ada Niebel, M.D., the lady doctor of the hospital, assisted me most ably throughout the operation. Chloroform was given by the Assistant-Surgeon Miss M. de Lemos.

The blood clots removed from the abdominal cavity were carefully examined, but no fœtus was found. Several fleshy pieces were found, like placental tissue, and a white smooth membrane, the remains of the sac, which showed villi on being floated in water.

The discharge of blood stopped entirely the day after the operation and never recurred. The patient suffered much from constipation during convalescence, and she needed repeated doses of mag. sulph. or sulphur confection. A small stitch abscess occurred, but healed rapidly. With these exceptions the patient made an

FIG. 1.

The anterior surface of the right Fallopian tube. This shows the small cyst-like prominence at the uterine end of the tube, which, when laid open, was found to be a diverticulum lined with tubal mucous membrane. The shaggy site of the rupture of the sac, which point is also the opening of the accessory ostium is well shown.

excellent recovery and left hospital quite well on 26th March 1904. The chief interest of this case is in the diseased Fallopian tube which I removed from the right side of the uterus. In the photographs, which illustrate this article, it

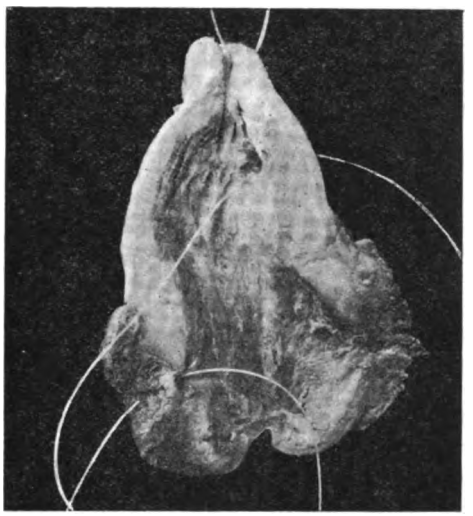


FIG. 2.

Showing the right Fallopian tube laid open by an incision along its upper surface. The upper bristle is merely for suspending the specimen. The middle one is passed through an opening in the mucous membrane into the diverticulum described in the text. The lower bristle goes through a hole in the mucosa marking the site of an accessory ostium.

Note.—The openings in the mucous membrane are much larger in this photograph than in the fresh specimen. The tube was some weeks in spirit solution before being photographed, which caused shrinking of the mucous membrane.

will be seen that the tube was considerably thickened, and, in Fig. 2, which shows the tube laid open from above, the thickness of the tubal walls, and the obliteration of the fimbriated opening will be noticed. The lumen of the tube is patent in its entire length, so the gestation did not take place there. I feel sure that this is a case which goes far towards proving the latest theories of German gynæcologists, which has been advocated lately in England by Dr. H. Russell Andrews, *viz.*, that "tubal" pregnancies seldom or never occur in the lumen of the tube, but in the muscular tissue of the tube wall.

About one inch from the obliterated fimbriated extremity of the tube, on the upper surface of the ampulla, will be seen in both figures a shaggy fleshy mass. This corresponds to the point of attachment to the tube of the mass of clot which I removed. A minute opening in this situation, through which, in Fig. 2, a bristle has been passed, connected the lumen of the tube with the peritoneal cavity. An inch and a half nearer the uterine end of the tube will be seen (Fig. 2) a second opening in the tubal mucosa. This corresponds with a small cyst-like swelling on the anterior outer wall of the tube. On cutting into this it was found to be lined with mucous membrane, continuous through the small hole with that of the tube, and its walls were muscular and serous like those of the tube. It was, in fact, a true diverticulum. This diverticulum is shown in Fig. I, a bristle having been passed into it from within and the small cavity laid open.

The views of the German authorities, who have worked upon this subject, are that the minute embryo burrows through the epithelial lining of the tube into the subjacent muscles and there develops. I put forward this case with the suggestion that diverticula, such as that shown at the uterine end of this Fallopian tube, may quite frequently form resting places for belated impregnated ova, and nests for their further development. At any rate, after rupture, it would be difficult to say whether the sac had developed in a diverticulum, or in the muscular coat of an otherwise normal tube wall.

I was at first inclined to think that in this specimen we had a case in point, and that here was a tube showing on its mucous surface the openings of two diverticula, in one of which gestation had taken place. On further consideration, however, I found it difficult to account for the presence of a fertilized ovum in a diverticulum from a tube whose fimbriated extremity was entirely closed. I could find no trace of an opening at the ovarian extremity of the tube, though it is, of course, quite possible that the fimbriated opening was patent when the fertilization occurred in October 1903, and became obliterated during the inflammatory changes following the rupture of the sac. I am inclined to think, however, that the opening in the ampullar portion of the tube is an accessory ostium, and that gestation took place at the site of its entrance into the tubal lumen. This would explain the absence of a clinical history of rupture of the sac, distinctly marked by sudden pain and faintness. No sudden giving way of a resisting tube wall occurred, but, I have no doubt, the fœtus was discharged from the narrow opening of the ostium, and perished, at an early stage of the pregnancy, probably when bleeding first took place on November 29th. The subsequent loss of blood was from the site of the placental attachment, probably the shaggy, torn prominence shown in the photographs.

Kelly (Op. Gynæcology, Vol. II, pp. 431-432) quotes Landau, Rheinstein and J. W. Williams as having drawn attention to tubal diverticula, and Kossmann (zeit. fur Geb. and Gyn. Bd. xxvii, p. 266) as regards the possibility of accessory ostia being factors in the arrest of the passage of fertilized ova to the uterus. This case, presenting as it does both forms of abnormality, is, I think, worthy of record. It also very well illustrates the clinical fact that the text-book series of events, a missed period or two and a sudden attack of agonising pain, are *not* to be expected in every case. In a large number of cases menorrhagia, or irregular bleedings dating from a period which "was not quite all right," are all the symptoms, and on these, with

the objective sign of a thickened tube or a lump in Douglas' pouch, a decision must be made as to treatment.

It is a much discussed subject, and one whose argument is quite beyond the limits of this paper, but I would say shortly, that, with proper precautions, no harm can follow early operation in cases presenting the above signs, more especially the sign of an *enlarging* lump in the pelvis. On the other hand, I have seen the most disastrous results follow the "expectant" method.

CASE OF LIGHTNING STROKE.

By R. H. CASTOR,

MAJOR, I.M.S.,

Civil Surgeon, Basein.

In view of its medical legal interest and its rare occurrence the details of the following case is forwarded :—

History—Two young Burman lads, aged 13 years each, and a Civil Policeman, aged 30 years, were collecting mangoes under different trees. One of the Burman lads (Mg. Ba Tin) was under one tree, and the Policeman and the other Burman lad, under another tree, situated about 20 yards away. On the 24th May 1904, about 12 noon, there was a very sharp clap of thunder, and one of these lads (Ba Tin) was struck by the flash of lightning which preceded it. Both the policeman and the other lad felt the shock also and were dazed by it for a few seconds. The Burman lad as soon as he recovered himself ran away to his house. The policeman seeing Ba Tin lying flat on his face, went towards him and after examination found him dead. He at once reported it to the Police school which was near by. This of course drew a large crowd. The matter was then reported to the police station, and the body eventually arrived at the Hospital at 3 o'clock P.M.

A.—POST-MORTEM EXAMINATION.
EXTERNAL.

(1) *Condition of clothes.*—The lad was only wearing a waist cloth and had no metallic objects on his person. The edges of the cloth were found torn into fringe-like shreds shewing marks of burning. There was also a large square (about a foot) patch, torn about the middle of the waist cloth from the part worn, in front, due also to the burn.

(2) *Destruction of hair.*—The hair of the front part of the head as far back as the vertex, was singed throughout, and on some places as much as 2 inches of the hair was removed. The eyebrows and eyelashes of both eyes were completely burnt.

(3) *Other injuries.*—There were slight superficial abrasions on the chest, abdomen and right hip, due to burns. There were no fractures, but there was a slight contused wound on the left side of the forehead evidently due to the fall.

(4) The *post-mortem* was held 5 hours after death at 5 P.M. and *rigor mortis* was present.

(5) The cornea was dull and the pupils were dilated.

(6) There was bleeding from the right ear—the blood being of a very dark color.

(7) Frothy fluid was exuding from the nostrils, more especially the left.

(8) Arborescent markings on the surface of the body were very evident on the upper part of the chest, the back, except at the inter scapular space, the arms, forearms, and hands, especially the palms. The legs were quite free.

B.—INTERNAL.

Heart—There was a slight amount of fluid in the pericardium. Both the cavities were full of dark fluid blood with no signs of clots. The right cavity was slightly dilated, otherwise this organ was normal; weight 5 oz.

Lungs—Normal. Weight of both 13 oz.

Liver—Was much congested, otherwise normal. Weight 2 lbs. 6 oz. Gall-bladder contained a small quantity of dark brown bile.

Spleen—Normal. Weighed 2 oz.

Stomach—Contained the morning meal consisting chiefly of rice, which was taken about 9 o'clock. The digestion was only partial, the rice grains were very evident 3 hours after ingestion, which is contrary to the ordinary belief that rice is "most easily digested."

Intestines—Normal, contained chyle.

Bladder—Empty.

Brain—The membranes and the vessels were found hyperæmic, especially the latter. There were no extravasations.

Remarks.—The tree evidently received the central part of the electric discharge, while the boy received the portion of "its encircling zone."

(2) The fact that only parts of the hair of the head and face were burnt shews that the thermic power of the flash was very limited.

(3) The fringe-like shreds only seen on the edges of the waist cloth shews the direction the spark must have travelled. The other square rent in the garment is difficult to explain.

(4) The bleeding from the right ear and the frothy liquid from the nostrils, especially left, indicated disorganisation of the brain structure.

(5) The escape of the policeman and the other lad was due to their distance from the tree struck. The former suffered no ill effects, but the lad did not feel well the whole day and had to take his bed for a headache. Both were quite well on the 5th June.

(6) The tree struck was about 40 feet high and had only few leaves on it. Three places on the tree shewed signs of the electric spark. One part at the junction of two big branches about 20 feet high shewed the whole bark removed on a piece about 6 inches square. The two other parts on the tree were on the stem situated 6 & 8 feet

high respectively, where only small portions of the bark were removed, as if burnt, but the scorchings were not so marked as the part situated higher up. The policeman also states that there were two small holes produced on the ground, one quite close to the tree, and the other about 2 feet away. These holes were not distinct when I saw them.

(7) During the last ten years ending May 1904 there were no deaths from lightning stroke in this town.

In conclusion my special thanks are due to Hospital Assistant C. Rockaswami Chetti for writing out the details of the *post-mortem* examination.

RADICAL CURE OF STRICTURE OF THE URETHRA.

By C. DUER, F.R.C.S.,
MAJOR, I.M.S.,
Civil Surgeon, Rangoon.

In the issue of the *British Medical Journal* of July 29th, 1899, Mr. Edward Deanesly, of the Wolverhampton and Staffordshire General Hospital, published some "remarks on the treatment of impermeable stricture of the urethra by excision of the strictured segment and suture of the divided ends." By this means, and by no other means I know of, it is possible to obtain a radical cure of stricture of the urethra. Such an end would appear very desirable among all classes of patients, but especially among uneducated natives, who often delay seeking advice till the stricture becomes impermeable or extravasation of urine occurs. It would appear, judging from the returns of operations at the Government Hospitals and from the absence of reports of such cases in the *Indian Medical Gazette*, that the operation advocated by Mr. Deanesley has not, in India at least, met with the notice it deserves. The recent discussion in the *British Medical Journal* as to the advisability or otherwise of retaining a catheter in cases in which Wheelhouse's operation has been performed would lead one to suppose that the radical operation by excision and suture has not become by any means universal at home. No doubt the operation has its limits, as Mr. Deanesley observes, "Multiple strictures situated at some distance from each other being obviously unsuited to this treatment, and the same may be said of cases in which the strictured portion of the urethral tube exceeds 2 inches in length. Such cases are, however, rare."

At this hospital we have to deal with many cases of stricture of the urethra, and a good many of these cases in our hands prove impermeable. The number of cases in which Wheelhouse's operation has been performed here by Col. Davis, Capt. Barry, Capt. Rost and myself during the last eight years is very considerable, but the results, and I would here refer again to Mr. Deanesley's paper, are not by any means completely satisfactory. I see no reason for supposing that cases of stricture are more common in Rangoon than in India, and I would therefore commend the operation of excision and suture for trial.

In the following cases the operation was performed with the best results. There were certain differences in the procedure to that employed by Mr. Deanesley to which attention will be drawn.

Case 1.—A Burman, aged 34, was admitted on October 30th, 1903, with the following history: Some four months previously he fell on his perinæum on a wooden bar from a height of about ten feet. When he tried to pass water after the accident he was unable to do so, and his perinæum became swollen and painful. He says a catheter was passed with difficulty and blood and urine drawn off. Some ten days after an incision was made in the perinæum, since which time the whole of the urine passed through the perinæum. At the time of admission he was passing urine in drops through a fistula to the right of the middle line and occasionally drops passed from the meatus. There was a mass of scar tissue in the perinæum. All attempts having failed to pass an instrument into the bladder, he was put under chloroform on November 2nd, the fistula and scar tissue were freely excised, and the ends of the urethra found without much difficulty. The distal end, enclosed by the corpus spongiosum, was separated for about half an inch, and the two ends were then brought together by four silkworm gut sutures passed from within outwards through all the coats and tied on the outside, one on the dorsal aspect, one on the vextral, and one on each side. The ends were left long projecting from the wound which was partially closed in front and behind.

Six days after the operation it is noted that the urine was passing in a good stream from the meatus and in a small stream from the wound.

On November 20th under chloroform the perinæum was opened up and the sutures were removed, with little difficulty, by cutting the knots. The following day the amount of urine passing by the perinæum was somewhat increased, but a good stream passed through the meatus. He was discharged on December 14th, at which time the perineal wound was firmly healed and urine passed only from the meatus in a stream, if anything, larger than normal. No catheter or instrument was passed throughout the treatment.

In the case reported by Mr. Deanesley the sutures were left to come away as they chose, and they took months to separate. I think their removal some three weeks after the operation an improvement, and it was much easier to do than I had expected.

The employment of a continuous suture might facilitate removal and possibly a silver wire suture, the ends of which could be twisted together. In many cases of bad but not impermeable stricture of the urethra, and especially among natives who will not understand the necessity of the periodical passage of dilating instruments, I think this operation might be performed with advantage. The main point to be demonstrated is whether or not it is uniformly successful.

Case 2.—An old military policeman who had suffered for years from stricture of the bulbous portion of the urethra, the result of gonorrhœa. The stricture had been dilated many times and several times by me, but on this occasion after repeated attempts extending over some weeks. I was never able to pass an instrument into the bladder. The stricture, which was about ¾ inch in length, was dealt with as in Case No. 1 with equally satisfactory results.

Case 3.—A young Phoongee, aged about 20 years, came to me from Maymyo. Some years before he had been gored by a buffalo in the perinæum. There was a large scar in the perinæum, and all the urine passed in drops through a fistula at the back of it. A sound passed along the penis to its base, where the urethra ended blindly, as was proved during the operation. Some two inches or more of the urethra had been completely destroyed. There was considerable difficulty in bringing together the two ends after dissecting them out and freely removing the scar tissue from the perinæum, and the penis appeared bent back like a case of hypospadias. The ultimate result, however, was quite satisfactory, and he informed us that erection was not interfered with.

WOUND OF THE DIAPHRAGM BY A WILD BOAR.

By W. D. HAYWARD,
CAPT., I.M.S.,
Civil Surgeon, Purnea.

On February 3rd of this year Sheikh Dukha, a boy of ten years old, was admitted to the Purneah Charitable Dispensary, suffering from a penetrating wound of the chest caused by a "cut" from a wild boar. The wound was on the left side of the chest, between the 9th and 10th ribs, through which protruded a portion of engorged and partially strangulated intestine about the size of a golf ball, or a little larger. There appeared to be no wound of the intestine; and the history showed that he had been knocked over and cut by a pig, the day before at 11 A.M., or about 26 hours before admission; he had been brought in twenty miles to hospital.

The patient was not collapsed, but the pulse was rather weak. He was said to have drunk milk after the accident, and there was no history of any extravasation. Chloroform was given, and the wound in the chest wall enlarged. It was then found that the 9th and 10th ribs were broken, and the sharp edges of the fracture rendered any attempt at reduction of the gut dangerous. Parts of the 9th and 10th ribs were stripped and removed, with bone forceps, on both sides of the fracture until a decent sized opening was made; air and bloody serous fluid being sucked in and out of the chest when the gut was pushed aside. The gut, small intestine, was then reduced inside the chest, and the left side of the chest was found to be occupied by several other coils of intestine and by omentum; the edge of the lung could be seen moving up and down with respiration. A Radial wound of the diaphragm about 3 inches long was found, but it was impossible to reduce the intestine and omentum through this back into the abdomen. I then opened the abdomen by a median incision, and keeping the gut on one side by sponges and swabs was able to put my right hand up under the diaphragm and to drag back the gut and omentum into the abdomen. The spleen which was enlarged most obligingly pushed itself up under the wound in the diaphragm, and, acting as the china egg, or bottle does in the heel of the stocking for the housewife, kept the parts on the stretch whilst I sutured the wound in the diaphragm, through the opening in the chest wall. This took four or five catgut sutures. The abdomen was then flushed out with weak antiseptic lotion and the wound closed; and a tube put in the chest wound which was also partially closed by sutures and the dressings applied. At the finish of the operation, the boy's pulse was feeble, and he was put to bed with hot bottles to feet and sides and given injections of Liq. Strychninæ and Ether. He was also allowed a small quantity of milk by the mouth and some brandy that evening. On the following day the pulse was still very feeble and respiration rather hurried; the abdomen was slightly tympanitic and the tongue coated.

He was given a turpentine enema and passed a large quantity of scyballæ, slept well. From then on, the tympanities subsided, the slight pain in the abdomen disappeared, and the progress of the case was good. The breath sounds on the left side gradually became normal in character as the wound closed, and the lung seemed to take up its work undamaged. Solid food was given from a week after the operation. The tube in the chest wound was gradually shortened, and the slight discharge from the wound gradually stopped; there was never any discharge from the depths of the wound or from the chest cavity, and by the twenty-fourth of February the abdominal wound was entirely healed, and on March 4th, or just one month and a day after his admission, he was discharged from hospital, the wound in the chest having also completely closed. The boy when he recovered, gave a most graphic description of his encounter with the boar. He was, it

seems, in the jungle and was bending down picking up some sticks from the ground, when the pig rushed out behind, knocked him head over heels without cutting him, and then stood over him and cut him, one "tush" taking effect, and making the deep wound above described. On the whole I think it may be allowed that the boy came very well out of his encounter with the pig.

MULTIPLE WOUNDS OF THE HEAD.

By BENODE BEHARY GHOSAL,

Assistant-Surgeon,

Jungipur, Murshidabad.

Wound of the head with compound fracture of cranium is always dangerous and frequently fatal; that involving brain as well, is more so. The usual termination in the latter case is death immediately or within a few days. But a few cases are recorded which resulted in recovery, though some portions of brain substance had been injured and lost. Such wounds were generally single. The following case is one of multiple wounds of the cranium, the wounds being six in number, each of which involved and exposed the brain. The patient, when almost cured, died suddenly of heart failure, after having been in the hospital for nearly a month.

History of the case.—Kushum Domni, about 20 years old, was brought by the Police to the Jangipur Charitable Dispensary, in a moribund condition, about 8 P.M. on the 7th January last. The patient seemed unconscious at the time, and considering her critical condition no attempt was made to rouse her. She was very restless and groaning, but as she did not move her right upper and lower extremities, right hemiplegia was apprehended, which was subsequently confirmed, the face not being involved. Breathing was a little hurried. Pulse, small soft, but regular, about 72 per minute. Both the pupils were dilated, but unequal, the left more so than the right. Temperature on admission was 98° F. The head was almost hacked to pieces. Her relatives stated that her husband, in a fit of temporary insanity, had inflicted the following injuries early in the morning with a *dao:*—

(1) An incised wound about 2¼ inches long and ⅓ inch broad over the right parietal bone. The bone was cut through, exposing the brain which was also injured.

(2) An incised wound about 1¼ inches long and ¼ inch broad, by the side of the above. The bone was cut through and the brain exposed.

(3) An incised wound about 2½ inches long and 1 inch broad in the posterior aspect of the sagittal suture on the left. The suture was cut through, and the brain, which had bulged out of the wound, was injured.

(4) An angular incised wound, literally two wounds united to form an obtuse angle, being 5 inches (3½ inches + 1½ inches) long and 1 inch broad over the left parietal and temporal bones. The bones were cut through, and the brain exposed and injured.

(5) An incised wound about 1½ inches long and ⅛ inch broad over the left temporal bone, the bone being partially divided.

(6) An incised wound about 2 inches long and ½ inch broad on the left side of the frontal bone. The brain was injured and had bulged out of the wound.

(7) An incised wound about 1¾ inches long and ¼ inch broad on the left parietal bone, just behind wound No. (6). The bone was cut through, and the brain exposed and injured.

(8) An incised wound about 2 inches long and 1 inch broad, and skin deep over the left temporal region.

(9) An incised wound about 1¾ inches long and ¼ inch broad over the left check.

(10) An incised wound about 2¼ inches long and ⅜ inch broad and bone deep over the back of left hand. The metacarpophalangeal joints of the left ring and little fingers were cut and exposed.

These wounds were stitched and dressed as far as practicable, and the left hand put up in a splint. The patient became very restless late at night, and a morphia draught was given. Next morning she was found to be conscious as she could understand questions when asked repeatedly, but there was loss of speech; she could put out her tongue when asked do so. Right hemiplegia was well marked. Pulse and breathing much the same as in the night before. Patient very restless. Pupils unequal, still. No motions. Dressings soaked. Temperature 100° F., which continued the same in the evening. I will now briefly relate her condition till she died on 2nd February 1903:—

(1) *Consciousness* was fully restored on the third day, and she remained all along perfectly conscious. She never passed water or motion in bed clothes, but always made signs to her friends, who attended her, when she had to ease herself. There was no difficulty in swallowing. She was always very restless at night, and sleeping draught had to be repeated for 20 nights in succession. She was conscious till her last moments.

(2) *Temperature.*—From the second to the ninth day of her admission, the morning temperature ranged between 98° F. and 101° F., and the evening temperature betweent 100° F. and 103° F. On the 10th and 11th days she had normal temperatures morning and evening. On the 12th and 13th days morning temperature was normal and the evening temperature 101° F. On the 14th and 16th days, both morning and evening temperatures were normal again. From the 16th to the 20th, the morning and evening temperatures ranged between 98° F. and 102° F. From the 22nd the temperature became normal till the last day, *i.e.*, the 27th day of her admission into hospital.

(3) *Pupils.*—At first were dilated, but unequal. On the seventh day they became normal and equal.

(4) *Digestive system.*—Bowels moved regularly once a day, except on the 21st and 22nd days, when she had no motions. Appetite was not good, but she could digest what she took. The diet consisted early of milk and sago and two ounces of rum. From the 24th day of her admission till her death she was given soft rice 4 ounces, and fish soup 2 ounces, in addition to the above. She was kept as comfortable as is possible in a subdivisional dispensary. On the 12th day of admission, three bed sores formed, two over the right shoulder blade, and one over the right hip.

(5) *The Wounds.*—Wounds were all stitched and dressed on admission. The scalp was gently pulled over the protruding brain substance and then stitched and dressed antiseptically. The dressings changed daily. There was no bleeding, but there was escape of cerebro-spinal fluid from the wounds over the left side of the head. The patient sometimes opened her dressings at night. On the seventh day, a few stitches were found to have given way and brain protruding through the wounds. The skin wounds were found sloughy-looking. The stitches were not renewed that day, and the next day the remaining stitches were found to have given way, and the cortical layer of the brain was found to be sloughy-looking. On the eleventh day, the sloughs separated, leaving granulating surfaces underneath. The stitches were renewed that day. After this, the wounds looked healthy, but on the nineteenth day, many stitches again gave way, which were not renewed. Almost all the wounds were found healed up on the twenty-third day except those on the middle of the head and the left side of the frontal bone, which were, however, covered with granulations. A chip of bone about ¼ inch long and ¾ inch broad was removed from over the wound on the frontal bone. The discharge was very slight all along. These two wounds were almost healed up, when she died on the twenty-seventh day of sudden heart failure. Considering the nature and multiplicity of the wounds, the progress of the case was very fair and satisfactory. The spicula of bone did no harm, though it was in the wound for twenty days.

Post-mortem examination.—On removing the scalp, incised cuts in the cranium were found involving also the brain substance. All the cuts were filled with granulation tissue except a gap over the left parietal bone and left side of the frontal bone (filled up with brain substance) about 5 inches long, 1½ inches broad posteriorly and 1 inch anteriorly. A fissured fracture was also found about 1½ inch long running forwards over the frontal bone from the gap. A cut about 2½ inches long and ⅓ inch broad was found over the sagittal suture running obliquely downwards and towards the right side, over the right parietal bone. A piece of skull about 1 inch long and ⅛ inch broad came out when the scalp was being removed exposing sloughy-looking brain substance underneath. There was also a fissured fracture about 2 inches long and a line broad running from the anterior aspect of the left temporal ridge of the frontal bone to the outer angle of the left orbit. On removing the skull and membranes, about three ounces of a turbid sanious fluid escaped from the surface and left lateral ventricle of the brain. The dura mater was attached to the inner side of the cranium where the wounds had healed. There were cuts in the brain corresponding to cuts in the left parietal bone, the left side of the frontal bone and the sagittal suture. There was a sinus commencing from the middle frontal convolution on the left side and ending in the left lateral ventricle, causing much loss in the brain substance. There was also a blood clot about 1 inch long and ¼ inch thick inside the body of the ventricle over the corpus striatum. The cortical layer of the brain on the left side was also partially lost. Other portions of the brain were healthy. All other organs were healthy. The immediate cause of death was sudden failure of the heart due to asthænia.

It is simply astonishing that the woman lived so long with all these injuries to her head, a single one of which was sufficient to cause death. I have not read of a single case of multiple wounds of the brain so interesting as this and who survived for such a length of time. Her consciousness was never lost except a day only, *i.e.*, the day of her admission, though the brain was so severely injured, and there was pressure within the left lateral ventricle of the brain as disclosed by subsequent *post-mortem* examination. So I would very much like to be informed where I can get records of such cases if there be any.

A CASE OF SEVERE FORM OF MALARIAL ANÆMIA TREATED WITH ADRENALIN CHLORIDE AND NORMAL SALINE SOLUTION.

By Hospital Assistant Sadasiva Pillai, C.M.S.,
Port Blair.

Cases of anæmia in the Andamans are mostly secondary in form, often due to malaria, though cases from other causes such as hæmorrhoids and intestinal parasites are not uncommon. In some of the cases that have occurred here, even when their causes were treated, very often the anæmic condition persisted. In the following case the effects of adrenalin chloride and normal saline solution have proved most satisfactory, and they are worthy of further trial in similar cases.

The case.—Patient, a male convict, aged 32 years, was admitted on the 27th July, 1903, for fever.

History.—The patient is a Hindu of Meerut District. He was a cultivator and a cooly by occupation, convicted 8 years ago, has had good health in India. There is no family history of syphilis, nor of any other cachectic disease either in him or among his near relatives. In India, just prior to his coming to Port Blair, he had an attack of fever which lasted for 15 days. He arrived in the Settlement during February 1896, he was first employed in the wood cutting file for about six months and then was all the while in healthy stations as water carrier and now is a peon. Since the time he arrived at Port Blair, he said that he was not keeping good health and had been admitted into hospitals for fever and bowel complaints. He has been under treatment during May 1897, 8 days for intermittent fever; during June 1897, 7 days for dysentery; and during June 1899, 4 days for intermittent fever; during September 1900, 8 days for dysentery; and during May 1902, 22 days for intermittent fever. The patient said that although he had bad health throughout, yet he did not suffer much from fever or dysentery, nor had he any kind of hæmorrhages until lately. Only before coming to hospital lately he had bleeding from his nose once which stopped soon after snuffing some powder. His weight on arrival in the Settlement was 121lbs., and occasional weighments since then are shown as 119, 110, 125, 128, 120, 119, and on admission was 120lbs.

On admission.—The patient looked a fairly developed subject, but pale and exhausted. Had fever, temperature 101·2° on the evening he was admitted, the skin and conjunctiva pale and faintly lemon yellow, tongue anæmic, bowels constipated, spleen and liver enlarged, both well below the costal margins. The size of the spleen was as far an inch above in line to the naval and an inch external to median line of body, hard and tender on palpation. The liver also was 2½ inches below the costal margin and painful on pressure. The patient complained of fulness of abdomen and pain all over the body, especially over epigastric regions. On auscultation, palpitation, and an anæmic bruit was heard over the heart and in the course of the carotid vessels. Lungs apparently normal. Blood was examined, and no malarial parasites were found.

Treatment.—Calomel and soda, saline diaphoretic quinine and biniodide ointment to spleen.

30*th July*—Evening rise of temperature; bowels again costive, had bleeding from nose this morning which stopped soon after cold application. He had increased palpitation on slight exertion, was indisposed to move about, and complained of dimness of vision on getting up.

Treatment.—Blue pill at night and saline draught in the morning; quinine and iron mixture three times a day.

1*st August.*—Increased exhaustion and complaint of giddiness on sitting in bed. Blood was again examined and no malarial parasite found. Red blood cells greatly diminished 960,000, and white blood cells 6,000 per c.mm. Hæmoglobin 24 per cent., the sizes of red blood cells were very irregular with many of microcytes and some nucleated cells. The differential blood counts showed large mononuclears 4·80 per cent., small mononuclears 72·00 per cent., neutrophiles 16·00 per cent., eosinophiles 4·20 per cent., and others 3·00.

Treatment.—Blue pill continued; iron, arsenic and quinine mixture three times a day, diaphoretic during fever, stimulant, milk, meat juice, egg mixture and broth.

5*th August.*—Patient getting worse in condition, stools semi-solid and of dark green colour, had slight cough, sputa frothy, mucus scanty. He complained of sleeplessness and uneasiness of heart. On auscultation chest sounds normal except for a few coarse bronchial rales. Heart sounds very quick and irregular, and a systolic murmur present at the base. Urine, colour high, sp. gr. 1014, reaction acid and contained no albumen nor sugar. Crystals of urates and no blood cells nor casts. Differential blood counts showed an abnormal increased percentage of lymphocytes and the neutrophiles decreased. Large mononuclears 1·76, small mononuclears 65-88, neutrophiles 26·27, eosinophiles 1·96, and others 4·11.

Treatment.—Continued, bromide at night, red ointment to spleen and mustard plaster to liver, feeding every second hour.

10*th August.*—No improvement, symptoms getting worse, evening temperature 101·6°, pain in the extremities and exhaustion increased, but spleen greatly reduced and soft to the touch. On ophthalmoscopic examination the conjunctivæ were pale and bloodless, the edges of the optic disc were irregular, the retinal vessels tortuous, especially the veins, full and dilated. There were scattered retinal hæmorrhages. Urine was of indican colour sp. gr. 1010, alkaline reaction, deposits phosphates and no casts. The different counts of white blood cells showed more or less the same percentage in lymphocytes and neutrophiles. Large mononuclears 1·96, small mononuclears 58·82, neutrophiles 35·08, eosinophiles 1·37, and others 2·74.

Treatment.—Continued.

12*th August*—Patient unable to get up, anæmia progressing, high temperature continuous, bowels loose, stool yellowish and green colour. Heart sounds quick, systolic murmur, also thrill over subclavian, carotid and femoral arteries.

Treatment—Continued.

13*th August.*—The patient had bleeding again from the nose this morning which stopped after cold application. The patient was quite unable to get up, very much prostrated, in fact, in a pernicious state, red blood cells very much diminished.—4,84,000 per c.mm. and hæmo-

globin 20 per cent., white blood cells 5,000 per c.mm.

Treatment.—With the above treatment, one dose of chloride of calcium 20 grs. in milk was given, also normal saline solution (·5 p. c. of soldium chloride) ʒxvi was given subcutaneously on the outside of right upper arm and solution of adrenalin chloride (1 in 10,000) m. 10 every fourth hour in an ounce of water by mouth.

14*th August.*—Patient had good sleep in the night and looked well in the morning. Patient said that he felt easy in heart, the sounds were heard, steady. Complained of thirst, bowels loose, of dark yellow colour. Red blood cells increasing ·7,72,000 per c.mm., hæmoglobin 22 p.c. and white blood cells ·5,000 per c.mm.

Treatment.—Another dose of calcium chloride was given this morning, also a saline injection ʒxix was given into the other arm, and adrenalin continued.

15*th August.*—Patient improving, heart sounds steady, appearance cheerful.

Treatment.—Continued with the dose of calcium chloride in the morning, saline solution one pint was given through rectum, and adrenalin continued.

16*th August.*—Patient expressed himself better and cheerful, bowels moved, semi-solid and yellowish, the thrill on the vessels not felt, pulse full and normal, and no subjective complaints whatever. The red blood cells still more increasing 1,00,000 per c.mm. and hæmoglobin 30 per cent., white blood cells 4,000 per c.mm.

Treatment.—Calcium chloride 10 grs., one dose, with the other treatment. Saline injection one pint was given subcutaneously into the outside of right thigh.

17*th August.*—Patient is very much improved; of his own accord he testified to be the good effects of the medicines and injections that he got in the last four days.

Treatment.—Calcium chloride, saline injection and the adrenalin were stopped, quinine, iron and arsenic mixture continued with nourishing food and stimulants, about ½ oz. of marrow of sheep bones was also given once a day.

18*th August.*—Patient much improved, the fever gone down to normal, appetite increasing, but he had his gums inflamed.

Treatment.—The tonic mixture and diets continued ; alum gargle to gums.

23*rd August.*—Patient very much cheerful, able to move about, appetite very good, bowels regular, heart sound normal, conjunctivæ getting red, spleen and liver reduced to normal size, red blood cells increasing. Eye symptoms disappeared.

Treatment.—Continued.

9*th September.*—Patient better, heart sounds and colour of the skin normal, growing in weight (125 lbs.), red blood cells nearly normal, 3,936,000 per. c.mm. with W. B. C. 4,000 and hæmoglobin 64 per cent. Still in hospital as convalescent.

Remarks.—In the above case distinct signs of improvements were observed from the 13th to 17th July 1903 after the saline injection and the administration of adrenalin and calcium chloride. The patient had been in a very precarious state indeed. The effects of these drugs are quite clear, the improvement in the number of red blood cells and the percentage of hæmoglobin from the very moment of injection and administration of adrenalin, nay the improvements in the heart's action and in the spirit of the patient. The effects of the adrenalin on the heart and of the saline solution in the blood were of undoubted value as the blood and the heart were the important factors in the disease requiring improvement. Certainly the calcium chloride has been a great help in the cure as it being the best hæmostatic to an anæmic patient. The most important of all the medicines used in this disease was the salt solution, but its true action in this blood as in many other cases in this hospital is not clearly known although its effects are often marvellous.

A CASE OF SUB-PHRENIC ABSCESS.

By Assistant-Surgeon SATIS CHANDRA BANERJEE,

Late House Physician, Medical College Hospital, Calcutta.

Shyama Bagdi, Hindu, male, *æt.* 45, a cultivator by occupation and a regular *toddy* —(fermented date-juice)—drinker, was admitted into the Medical College Hospital in Lieut.-Colonel Lukis's ward on the 2nd June 1902.

About two months previous to his admission after a heavy drink of *toddy*, he felt a dull aching pain diffused over the epigastric and right hypochondriac regions. Since that date the pain never left him but gradually became worse. By-and-bye he had fever in the evening, his appetite failed, and he noticed a tenderness which gradually became located to a circumscribed area 3″ × 3″ below the subcostal angle. Any exertion intensified his pain and tenderness, as also a heavy meal; and gradually it became so bad that he had to give up his daily work and take to bed.

About three weeks before his admission he noticed that the pain in his abdomen became specially acute after a heavy meal, and that vomiting often relieved it to a certain extent. The vomited matters were invariably sour, and consisted of undigested food material with streaks of blood. He had never brought up blood in any quantity, but passed black blood with his stools at that time.

A week before his admission, after a heavy meal, he felt a severe stabbing pain at his stomach. The whole body was bathed in perspiration, he felt very weak and sinking,

and could not lie flat on his bed. The next day he noticed a bulging over the hepatic region, his abdomen became very tender, his fever became aggravated, and he began to feel difficulty in breathing, which day by day became worse. There was no history of dysentery or malarial fevers.

On admission he *complained* of severe pain and tenderness over his liver, worse on standing up or stretching his leg, of difficulty in breathing, not relieved either by sitting up or lying down and of inability to lie on his left side. The pain became less on lying on his right side with legs drawn up.

The patient had an anxious expression and was very restless. Tongue dry, and coated and slightly brown at the middle, appetite bad, bowels constipated, temperature rising to 102° in the evening.

The right hypochondriac region and the lower intercostal spaces of the right side were bulged out and widened. The right side of the chest moving less than the left.

The liver was not felt at its normal situation, fluctuation was felt over the hepatic region below the costal arch, and emphysematous crackling at a place 2½″ square to the left linea alba and about 2″ below the costal arch. There was a hard mass not moving with respiration apparently adherent with the abdominal wall extending from 2″ below the costal arch in the nipple line to the level of the umbilicus. Its lower border was horizontal and it was dull on percussion. From its upper border to the right sixth rib there was an area of hyper-resonance, there being no liver dulness whatever in front, but it was elicited at the back. Both dull and hyper-resonant areas terminated at the middle line on the left and at the mid-axillary line on the right. The part of the chest from the right 6th to the right 3rd rib was tympanitic.

Breathing was thoracic and 40 per minute. Breath sounds were feeble at the right base. There were crepitations on the right side and friction sounds below the right nipple. A splash sound was marked, vocal fremitus and resonance diminished in the right axillary region.

Apex beat of the heart in 5th space outside the nipple line. Pulse small and feeble and 120 per minute.

The case was diagnosed as one of *sub-phrenic abscess* following perforation of gastric ulcer on the anterior wall of stomach, and was accordingly transferred to the surgical ward on the 3rd June.

Operation.—On the 4th June he was operated on by Lieut.-Col. Charles. The part being made antiseptic an incision of about 2½″ was made just below and parallel to the costal margin on the right side (hypochondriac region) about 2½ inches from the linea alba. A quantity of extremely fœtid pus, thin in consistency, mixed with some milky (chylous) fluid and gas came out in a stream during each inspiration, the total quantity of fluid amounting to about 2 pints. On introducing two fingers through the wound the liver could not be felt, but it was touched with the tip of a long probe. The bulging and widening of the right lower intercostal-spaces disappeared, and the patient felt great relief and was able to lie on his back with comfort. A large drainage tube was inserted into the cavity.

Progress of the case after operation.—For the first 24 hours an enormous quantity of fluid slowly drained away, and the patient improved daily. But on the 14th June, *i.e.*, ten days after operation, he had bad cough and brought up muco-purulent matter, which gradually became entirely purulent. The discharge from the abscess cavity gradually became less, and he recovered within a month and a half after operation. At the time of his discharge breath sounds were distinctly audible at the right base.

Remarks.—The hard mass at the level of the umbilicus occupying the right half of the abdomen, was caused by adhesions of the great omentum to the abdominal wall. The liver was pushed backwards by a collection of gas between the diaphragm (which was also pushed up) and the liver, as it could not be felt by finger through the operation wound, but only by a long probe.

The tympanitic area terminating at the right third rib, the presence of friction sound below the right nipple and the fact that pus and chylous fluid came out, on opening the abscess, in a stream during inspiration, show that the abscess cavity containing pus and gas was outside the pleural sac, and it was compressed by the descent of the diaphragm during inspiration. Had the pus and gas gone into the pleural cavity and thereby formed into a case of pyo-pneumothorax, the whole of the right side of the chest would have been hyper-resonant, and there would not have been any friction sound below the right nipple, and when the patient recovered, the right lung would not have expanded so well.

The pushing over of the heart to the left, as shown by the apex beat at ½ inch outside the nipple line, in the fifth space, shows the unbalanced elastic traction of the left lung owing to part of the right lung having been compressed by a collection of pus between the under-surface of the base of the right lung and the upper-surface of the diaphragm, shut out of the right pleural cavity by adhesions around it, and this pus gradually worked its way through lung, resulting in purulent expectoration ten days after the operation. Had there been no such compression of the lung tissue in the thorax, the heart would have been tilted upwards by a pressure of the collection of pus and gas below the diaphragm. Whether there was any actual perforation of the diaphragm or the pus was carried through the lymphatic channels of

the central tendon of the diaphragm to the under-surface of the lung, could not be ascertained. As Dr. Greig Smith in his *Abdominal Surgery*, and Dr. Dickenson in *Allbutt's System of Medicine* maintain that pus lying in contact with diaphragm makes its way through it, it is probable that there was perforation of the diaphragm.

The localised epigastric pain worse after meals, vomiting, bringing up of blood with vomit, and the passing of dark blood with stools, point to the presence of gastric ulcer.

The sudden intense pain at the stomach, the collapse followed by great tenderness of the abdomen, the inability to lie flat on the back and the thoracic respiration, were due to perforation of gastric ulcer and subsequent peritonitis.

The situation of the ulcer on the anterior wall of the stomach had been suggested by the position of the abscess in the greater sac of the peritoneum, as well as by the pushing down of the liver backwards.

Had the ulcer been situated on the posterior wall of the stomach, the bursting would have taken place into the lesser sac, the liver would have been pushed forward and felt distinctly in front, and hepatic dulness would have rather been increased anteriorly.

A CASE OF SYPHILITIC DISEASE OF THE LIVER PRESENTING THE SYMPTOMS OF AN ABSCESS OF THE LIVER.

By C. BARRY,

CAPTAIN, I.M.S.,

Civil Surgeon, Maymyo.

Patient was a European, aged 38 years. The family history was good. No history of phthisis.

Previous history.—Has always been a liverish subject, but otherwise enjoyed good health. Fifteen years ago had a venereal sore with symptoms of syphilis which, however, were only treated for a couple of months. Eight years ago was sent to Europe on sick leave. At that time he had been steadily losing weight and was much debilitated but had no fever, was told his liver was inflamed. He went to Carlsbad and was much benefited by the treatment there, regaining his weight and strength.

For as long as he can remember has been troubled with a short dry cough; at times more frequent than at others but never quite disappearing. Has never had dysentery or any other bowel complaint.

Present illness.—In March this year began to suffer from low fever after a trip into the jungle. The temperature rose to 100°F. every evening and fell to 99°F. in the morning. There was slight shivering when the fever rose, and he felt languid but continued to do his work. The fever continued daily, and first came to see me at the beginning of April. At this time the patient was thin and sallow, the conjunctiva was yellow, and the tongue coated. The fever was recurring every day at the same hour in spite of some quinine he had taken and he was also troubled with a short dry cough. The lungs were normal. There was no enlargement or tenderness of the spleen, though an examination of the blood showed a few malignant tertian parasites. The liver was slightly smaller than normal but of irregular shape, a tag of liver substance coming down in the epigastric region to about one inch from the umbilicus, the organ itself was, however, free from any pain or tenderness. The bowels were regular and normal and the motions of good colour. The urine was normal in all respects.

As quinine had been taken only in small doses and at irregular intervals, a course of this drug was persevered in being given in 10-grain doses, both hypodermically and by the mouth. No improvement, however, took place, the only difference being that the shivering when the temperature rose ceased, otherwise the fever rose regularly to 100°F. or 100 5°F. every evening. At the end of fourteen days distinct friction could be heard and felt over the upper portion of the liver in the mid-axillary line, but there was no pain or tenderness over the liver area.

The friction spread round to the base of the lung behind and to the sternum in front. There was no increase of fever, and no rigors though some muscular rigidity was noticed on the right side of the chest and abdomen.

Potassium Iodide grs. 30 was now given daily. The symptoms, however, did not improve, and so a week later the liver was explored with trocars under chloroform. On introducing a trocar between the 7th and 8th ribs a small quantity, about one drachm, of thick white curdy pus was drawn off and then the trocar became plugged. The trocar was now cut down on a piece of rib being excised. On inducing the finger it was found the chest cavity had been opened and the liver was not adherent. The upper surface of the liver was palpated with the finger and a soft diffluent area was found somewhat lower down on the upper surface of the liver which appeared adherent to the chest wall. A trocar was pushed into this but no pus could be withdrawn, and on withdrawing the trocar it was found blocked with thick white cheesy material. A second trocar pushed in close by produced the same result. The area felt from above was now cut down on between the 9th and 10th ribs, and the liver found only partially adherent to the chest wall. As the patient's condition was now very low, the wound was plugged with gauze and the operation concluded for the present. The upper wound was also closed, the pleura first and then the skin being stitched together.

The patient rallied rather slowly from the operation, and for four days suffered from a

sharp attack of pleurisy. On the fourth day the temperature fell to normal and remained so. On the second day after the operation mercurial inunction, a drachm and a half a day was begun, and this combined with potassium iodide grs. 30 was continued with daily. Convalescence was on the whole rapid, and in two weeks the patient was able to leave his bed, and at the end of a month to leave for England. About twelve days after the operation some periostitis of the ribs gave a little trouble, but disappeared in a week. At the time of leaving for England, the patient was convalescent, the wounds had healed, all signs of pleurisy had gone, and there was no pain or tenderness over the liver. He was gaining weight and the skin had become much clearer, and the temperature had been normal since four days after the operation.

The diagnosis arrived at in this case was that of a syphilitic gumma of the liver producing symptoms resembling those of abscess of the liver. The points in favour of this diagnosis being the history of syphilis and the thicky white cheesy material obtained from the liver; it was much too thick to flow through any trocar tube and only penetrated into the tube a short distance. Also the fact that the patient quickly became convalescent after the operation when he was placed on mercury. If the case had been one of ordinary abscess of the liver, the operation as performed could have had no lasting results. That the potassium iodide proved so much more beneficial after the operation than before, it may be due to the tension in the gumma being reduced by the withdrawal of a little of the broken down material from its interior.

I have now altogether seen three cases of syphilitic disease of the liver producing all the symptoms of an abscess of the liver. In one there was general enlargement of the liver with high fever rising every night to 102° or 103° F. followed by profuse sweating. Repeated punctures of the liver gave no result, and it was not till the patient was put on anti-syphilitic treatment that any benefit resulted. After this treatment was begun, the symptoms rapidly abated, and the patient made a complete recovery, and the liver returned to its normal size, though he had been ill for some months previously. In the other case there was local enlargement of the liver with fever and sweating, the enlargement was incised and a breaking down gumma was exposed. This was scraped out, the patient at the same time being put on mercury and potasium iodide. His condition rapidly improved.

My excuse for reporting the above case at such length is that the literature on syphilitic disease of the liver of this nature is rather scanty, and it appears to me that considering how prevalent syphilis is, this complication may be present more often than is imagined. In cases of supposed abscess of the liver where exploration of the liver gives negative results, an antisyphilitic course of medicine may clear up the diagnosis and give very beneficial results. However the symptoms so closely resemble those of an abscess of the liver in its early stage that I do not think it would be safe to postpone exploration of the liver with trocars. Only after a thorough exploration had given negative results would I suggest antisyphilitic treatment should be persevered in.

LIGATURE OF THE BRACHIAL ARTERY AT THE BEND OF THE ELBOW FOR RADIAL ANEURISM.

By E. H. WRIGHT,

MAJOR, I.M.S.,

District Medical Officer, Mangalore.

K. M., a fisherman and boatman, by occupation, 39 years of age, came to the out-patient department of the Municipal Hospital, for a painful throbbing swelling of the right waist. He stated that two years previously he had struck the affected part with the oar whilst rowing, that a few days subsequently he noticed a small swelling about the size of a pea at the part injured. This swelling gradually increased in size until it had reached the present bulk. For the past few days, the swelling had become very painful, and he experienced much throbbing aching pain, and he noticed the part was hot and red, and for these reasons he had applied for relief.

On examination, a strong muscular adult complaining of a painful swelling on the right wrist. Over the region of the right radial artery there was a pulsatile swelling; the tumour, the size of a bantam's egg, was situated over the radial artery just before it passes under the extensor tendons to reach the back of the wrist. It was hot to the touch, the skin was red in colour over the swelling, and felt rather œdematous; it pulsated freely and all the classical signs of aneurism were present. It was evidently an inflamed aneurism threatening to burst. The man was admitted into the Wenlock Municipal Hospital, and on the following day, as the aneurism was commencing to give way, I ligatured the right brachial artery at the bend of the elbow under an anæsthetic. The operation presented no difficulty, and was completed within 20 minutes. The arm operated on was well swathed in cotton-wool and kept warm after the operation: the circulation was re-established in 48 hours. The sutures were removed on the seventh day, the wound having healed by first intention; the aneurism became filled with clot and looked a dark, black colour—oozing a little darkish blood from the point of rupture. This gradually ceased. The tumour became hard and fibrous and diminished so quickly in size that when he left the hospital, 24 days after operation, there was only a small

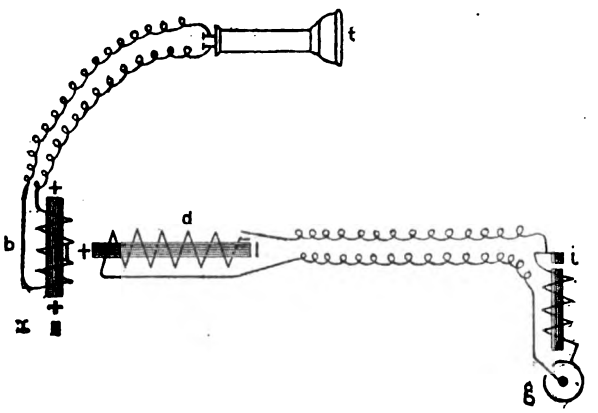
thickening left over the seat of the original aneurism. I have seen the man frequently since, and there is now no trace of any tumour, and he is capable of carrying out his previous calling without any discomfort and of course without a right radial pulse, the aneurism being completely cured.

Remarks.—The choice of ligating the brachial rather than excision of the aneurism, I think, was certainly justified by the result, and this course was adopted chiefly owing to the unhealthy condition of the parts locally and especially probably the ligatures would not have held on the radial artery for the same reason, and some large branches were given off from the radial in close proximity to the aneurism. There was no loss of sensation in the operated arm, and the man has perfectly regained power and strength of the right arm which had previously become considerably diminished.

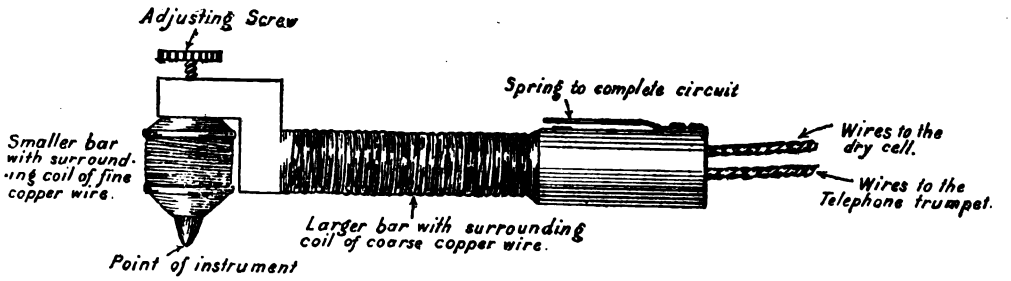
Dr. MARTIN JANSSON'S SIDEROPHONE.

By R. H. ELLIOT, [M.D., B.S. (Lond.), F.R.C.S., Major, I.M.S.

The essential part of this instrument, called by its inventor the 'inductor,' is shown in the



accompanying drawing, and the various parts of the whole apparatus are illustrated in the diagram.



The inductor consists of two iron bars, united by a frame of ebonite and so placed that the smaller bar *b* (see diagram) is at right angles to the larger bar *d*. The latter is surrounded by a coil of medium copper wire, which is connected with a small dry-cell element *g*, fitted with an interruptor *i*.

The smaller bar is enclosed in a long coil of very thin copper wire, which is connected with a telephone trumpet *t*.

When the primary circuit is closed, the enclosed iron bar *d* becomes magnetised, and in its turn it magnetises the smaller bar *b*. Secondary currents are thus induced in the fine coil around *b*. It will be observed that the prolonged axis of *d* cuts *b* at its middle; two secondary currents of equal strength and running in opposite directions are thus induced in the fine coil surrounding *b*; these meet in the telephone trumpet and so long as they are equal in strength, produce no action there. When, however, the point of the inductor is approached to any small mass of iron *x* an alteration in the magnetic force of that half of the bar occurs, leading to an intensification of the induced current on the same side; the overbalance of current will at once manifest itself by a noise heard in the ear-trumpet.

The instrument can be most accurately adjusted before use by means of the small screw shown in the drawing, since this screw contains a tiny piece of iron.

The whole instrument, inductor, cell, and all fits into a very handy box and in no way suffers by transportation. The cost is £3-18-0.

I was enabled to try it on several small iron splinters, and the sound produced was unmistakeable. Professor Widmark has recently tested it in 23 cases of iron fragments imbedded in the eye-ball, and in 18 it gave positive results. In 5 the deeply imbedded bodies were too tiny to work the instrument. It is therefore not sufficiently sensitive for all cases met with in ophthalmic practice, and cannot at present entirely replace the sideroscope. Its portability and the ease with which it can be used render it a very valuable instrument in a large percentage of cases.

In the general surgical wards of the hospital, where very minute fragments of metal are seldom if ever in question, the instrument has proved most valuable.

The inventor has kindly undertaken to supervise the construction of the instrument for any medical man who wishes to obtain it.

Address :—Dr. MARTIN JANSSON,
Prof. Widmark's Eye Department,
The Royal Hospital,
Stockholm, Sweden.

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AUGUST, 1904.

INSANITY IN BENGAL.

In the four pages, which is the "maximum limit" for the annual report on the Lunatic Asylums of Bengal, Colonel S. H. Browne, M.D., C.I.E., I.M.S., has managed to compress a considerable amount of interesting information about insanity in Bengal. There are six asylums in the Province, in which, during the year, 1,348 lunatics were treated, with a daily average of 1,053. This figure 1,348 is the highest on record, but Colonel Browne is very guarded in drawing any inference from this, that insanity is increasing in Bengal. As far as we can trust the Census figures for 1901, there has been a decrease in the number of lunatics in the Province, but here again he points out that part of this decrease may be due to the more careful exclusion of cases of cretinism and fever delirium than was the case in former Censuses. Therefore he decides that it is probable that the increase in the number of certified lunatics is merely due to a more free and frequent resort to the use of asylums, a matter for congratulation than otherwise. The number of cures amounted to 41 per cent. of the number of admissions, but this does not mean that 41 per cent. of the *new* admissions were cured. Of the 1,348 lunatics treated throughout the year, 106 or 7·8 per cent. died. This figure is practically identical with those of former years. If we calculate the death-rate on more familiar (but not necessarily more correct) lines, the death-rate in Bengal Asylums amounted to 100 per mille, while in the Punjab it was 76, in Bombay 83, and in Burma 86 per mille of daily average number. The chief causes of death were tuberculosis 28 deaths, dysentery and diarrhœa 19 deaths, cholera ten deaths, pneumonia, six deaths, and "cerebral causes" five deaths. On this Colonel Browne comments as follows. "Tuberculosis is most frequent in the Dullunda and Dacca Asylums, a circumstance which is probably the result of a combination of causes, such as extensive prevalence of the disease among the surrounding population, climatic conditions, and the unhealthy sites on which these asylums are built and defects in the accommodation. At Dacca there was slight overcrowding throughout the year, and here the deaths were most numerous." We note that 50 superficial feet per patient is given as the area available in the wards for each patient. This cannot be called a liberal amount for patients of this class.

It is noted that there is no special form of "Asylum Dysentery" in Bengal, dysentery as a cause of sickness and mortality is common enough, but is apparently of the same nature as the dysentery in jails. Cholera in two asylums caused no less than ten deaths, and in the case of the old badly situated asylum at Patna was attributed to the carriage of the infection by flies from the infected bazar which surrounds the asylum grounds. It is satisfactory to note that no cases of plague occurred among the lunatics. It is pointed out that in asylums the lunatics are drawn from the poorest classes of the community, whereas the Census showed that the incidence of insanity is greatest among the well-to-do, but as Colonel Browne points out the explanation is simple, the well-to-do can support and look after their insane relatives, whereas the poor or the criminal lunatics drift to the asylums.

As regards the variety of insanity mania as usual heads the list, sixty per cent. of total cases being due to this cause, next comes melancholia. General paralysis of the insane is not common in any Oriental race, and no case was seen in any Bengal Asylum during the year. The large number of mania cases is, of course, due to the fact that such are usually noisy and violent and therefore more likely to be sent to an asylum.

We are glad to see Colonel Browne's scepticism as to the so-called *causes* of the insanity As usual *ganja* finds a high place on the list, but as the Inspector-General says "the etiology of insanity in Bengal has yet to be worked out"—a task which we hope will be undertaken when a whole-time medical officer with special qualifications is appointed to the new Central Lunatic Asylum, which is still under construction. In conclusion, we can agree with Colonel Browne that the Bengal Asylums have been carefully and judiciously managed throughout the year.

THE RECRUDESCENCE THEORY OF PLAGUE.

We have received a copy of a very interesting review of the progress of plague in the Madras

Presidency in the years 1902-03. All but two of the districts bordering upon Mysore Territory have at one time or another been indigenously infected, the rate and degree of their infection is apparently measured by the extent to which human traffic is involved, and not by meteorological differences between individual districts. We direct especial attention to the following extract, in which Colonel W. G. King, the Sanitary Commissioner, gives his views on the recrudescence theory, views to which his eminence as a Sanitarian gives special weight. Lieutenant Colonel King writes:—

"Perhaps there is no more harmful theory than that which has been largely adopted by the medical profession under the name of recrudescence. With the profession, the term is used with reservation, but, with the laity, it defines the belief that a town once affected with plague, must suffer periodical return of the disease. It is held that once it has been introduced, it is merely a matter of meteorological conditions as to how many months *per annum* the disease will continue; and that this will occur, year after year, in spite of the best and most expensive efforts to prevent it. Consequently, it has been argued that all preventive measures are merely the outcome of theory, and that as plague "has come to stay" all sanitary measures against it are senseless. It is particularly a favourite argument that the total mortality from plague is not so great as that from cholera, which is with us annually, and therefore we should be content with it. Others, again, point to small-pox, and maintain that we should treat plague in the same way as we do small-pox, namely, by protective vaccination with, say, Haffkine's vaccine, and ignore any but routine sanitary efforts. But we have in plague a disease more difficult to deal with, and far more reaching in its effect than either cholera or small-pox. We know precisely in what way infection of small-pox is scattered, and with ordinary care all infective matter can be segregated; whilst we have in vaccination a mode of protection that, so far as is known, affords infinitely longer protective influence than Haffkine's vaccine. Although it is possible for modified cases of small-pox to escape detection, it is rarely that the person with the disease can evade exhibiting its symptoms *on his face;* whereas, plague can be introduced into a locality by persons having no apparent external symptoms, and quite willing to exhibit bodily fitness by digging graves for their fellow-beings. As to cholera, its method of spread is so well recognized that nothing but gross carelessness on the part of the local authorities permits spread; and, indeed, the same might be said of small-pox, because, in the presence of re-vaccination, it should be possible, and has been proved up to the hilt to be possible, for small-pox to be practically unknown. Probably, in the case of cholera, even in the presence of neglect, three weeks may see the end of an epidemic; but in the case of plague, its introduction implies, in the absence of efficient sanitary care, slow and persistent spread of a fatal disease for many months and, in the presence of neglect, annually recurring incidence. It is this *persistence* that brings into play a factor which disturbs such moralizing; I allude to the influence which plague has upon the financial condition of communities. When a town is first infected all trade is at a standstill, and great financial loss occurs as a result of the inevitable exodus. But even when a condition is arrived at when no "plague scare" exists and apathy follows both in the public and official mind, the stigma of plague being amongst a community inimically disturbs the commerce and trade of the people concerned. In this form, an infected locality pays a very heavy indirect tax, and the question of the advisability of an attempt to stop epidemics of plague by special preventive measures, even with philanthropy put aside, must take cognizance of this fact. As time progresses, the condition of this Presidency may become such in reference to plague as to demand such considerations. Personally, I think an organisation on the present lines will be found to have a balance in its favour up to a period when there is very little else but actually infected areas throughout the country. In the meantime, the delay effected by fighting the advance of plague inch by inch protects trade and saves lives, and gives the local authorities breathing time in the still uninfected parts of the country; so that, by judicious removal and improvement of over-crowded filthy centres in our towns, and by encouraging improvements in individual dwellings' and, especially by breeding a healthy public opinion against concealment of cases by individuals, the importation of plague into a locality may, in the presence of timely sanitary measures, no longer be regarded as a matter of public moment. In this connection, I would allude to what is popularly known as the "common sense policy" of plague. This consists of waiting to help the people until they learn to help themselves. Such a policy does not take account of the patent fact that solidarity of public opinion in India on any of the numerous subjects that have been ripe for decision during the past thirty years, does not yet exist in any district, nor in any town, nor in any village, nor in any so-called undivided family, and that any apparent solidarity would readily yield before the first blast of idle superstition or suspicion of honesty of intention. A semblance of public opinion is approached when a village determines to protect itself against another by insisting upon quarantine; but the real factor, I believe, here, is not a public opinion but autocracy of the village head; and the test of its genuineness comes into play when the wife of the village head maintains, she must receive her mother from an infected village! Leaving matters to the people has been fairly tried in the Mysore State since 1900. No compulsion of any description is used; but they are as far off from the Utopia of united public opinion as the day on which plague was first introduced. In the meantime, this common sense system of Mysore is a terror to its immediate neighbour—the Madras Presidency.

But what I have said so far, scarcely touches the argument of those who would contend that plague measures are absurdly expensive because useless, in the face of the fact that "recrudescence" constantly occurs.

Now, this is an argument of which, if it were founded on truth, I have always felt the justice; but, I have not been able to satisfy myself that there is anything in connection with the behaviour of the plague microbe that permits the belief that recrudescence is inevitable. It is a subject on which it is unfortunately very difficult to gather facts, when dealing with a free population; but the arrangements in this Presidency, given unusual facility for tracing the mode of introduction of epidemics. Although I believe it quite possible to place a mass of crude statements on record which will prove that recrudescence actually does occur in this Presidency, I must state that so far as evidence has been dissected, it is demonstrable that recrudescence is by no means a necessary sequel of the disease. The theory that recrudescence is inevitable is largely due to the belief that the plague microbe can flourish in damp soil, and especially in the damp cow-dung floors of native houses. But if the laboratory evidence be examined, it will be found of a very slender, and, in many cases, contradictory nature; whilst, in practice, instances after long quiescence of the disease appearing in infected dwellings do not fully exclude infected clothing. In short it seems to me the chances are that, in the majority of cases, the vitality of the plague microbe in the midst of the mass of micro-organisms naturally in the soil must usually be measured by days and not by months. It is probable that, over and over again, in the midst of what I conceive to be the very fairly organized system of disinfection carried out in this Presidency, there must have occurred cases where infected houses and infected soil had been neglected, without recrudescence occurring. But I trust this opinion may not be regarded as pointing to the uselessness of our system of disinfection. On the opposite, even if as I hold, the infection of soil may be measured only by days, it follows that every house carefully disinfected limits the extent of scattering from its centre of plague germs *during their period of vitality*. If recrudescence occur at all, I personally should think that it would be infinitely more likely to result from the renewed vitality and vigour of microbes existing upon *stored* clothing than by microbes attached to the soil or the walls of dwellings. If recrudescence were inevitable, or frequent, it should certainly be capable of demonstration in respect to our large towns. I therefore attach a statement showing the manner in which the origin of each epidemic has been traced in our municipal towns." [Tables not printed.]

"If, then, I do not ascribe to recrudescence the reappearance of the disease in previously-infected towns, it may be asked in what manner I would account for its occurrence. I consider, although when an infected locality is close to an uninfected, it is possible that grain, merchandise and articles of clothing may be the causes of importation of infection, that, *in the majority of cases, it is the human being which is the bearer, and that, by whatever means brought about, fresh importation of the disease, not recrudescence, is what is really met with*. If this be correct it is necessary to account for the apparent disappearance of the disease amongst human beings in a locality. It would be observed that the Collector of Bellary states that I regarded the outbreak in Adóni as affording "the only real instance of recrudescence" with which I was acquainted. This is true; but the statement requires some interpretation. In Adóni there had been plague in March, that is, at a time when during the hot season the detection of plague in reference to spread was under unfavourable conditions. Accordingly, the local authorities declared it had been stamped out and dispensed with their special staffs. But, in the meantime, there occurred what was thought to be a cholera epidemic, of which a few cases only could possibly have been seen for identification. When plague reappeared in July, I had no difficulty in showing that, disregarding reported cholera deaths, the general mortality in the town had greatly increased from March onwards. In short, I conceived that plague had never really left the town. This is an illustration of what really occurs in indigenously-infected areas. If plague staffs are hurriedly withdrawn from the midst of a population recently infected with indigenous plague, "dropping cases" occur, which maintain the potentiality of the epidemic, which is duly exhibited by increased energy on return of the favourable meteorological conditions of the cold season, *and this I conceive is the only way in which the term recrudescence is applicable*. The moral is (and I speak only for conditions found in this Presidency) *that given correctly trained staffs employed in numbers sufficiently large to keep the population under surveillance during the whole year, and not solely during the cold season*, plague could be confined to imported cases received from foreign territory. The persistence of plague in the neighbourhood of Hospet in the Bellary district and its *slow advance* from thence in the current year, under better conditions of organization of the hot-weather staff, confirms me in this opinion, when comparing results with a period of abolition of the plague staff round Adoni, notwithstanding its recent acknowledged appearances, and the marked increase of the general mortality within the town and the surrounding areas. In this connection, I would state that the use of so-called "firka circles" for hot-weather supervision places too large an area in charge of a single Sanitary Inspector to secure the nature of surveillance of the people required."

Current Topics.

SANITARY LECTURES TO SOLDIERS.

That much of the difficulty felt by the Medical Department in carrying out the requirement of modern sanitary science is due to the more or less general ignorance of the rank-and-file of the army of the elements of Hygiene is a fact which will scarcely be disputed. That some of this ignorance is removable, and that it should be removed is the opinion of many Medical Officers well qualified to judge. From time to time we have heard of spasmodic and possibly half hearted-attempts to do something to remove this ignorance. We firmly believe that it is a wise procedure to educate the

private soldiers and the officer of an army in the elements of Hygiene. Unless they understand and grasp the necessity, soldiers simply will not bother to carry out in anything like a thorough fashion the procedures recommended by the sanitary authority.

We are led to make these remarks by the perusal of two admirable lectures on enteric fever and its prevention recently delivered at Maymyo in Burma, by Captain N. O'Gorman Lalor, I.M.S.

It is not necessary in the pages of a Medical Journal to repeat all the arguments and statements used by Captain Lalor, but we may remark that his first lecture consists of an excellent résumé of the known facts of the causation of enteric fever, among troops both in camp and cantonment, and gives evidence of the careful study of the literature of the subject by the lecturer. We may therefore turn from etiology to prevention and comment upon some of the suggestions made by Captain Lalor.

He discussed prevention under several headings:—

I.—Means designed to prevent the carriage of the infection by a regiment.—In his first lecture Captain Lalor had pointed out the experiences of the American Armies in the Camps where they collected prior to embarkation during the war against Spain in Cuba. As in any large body of men collected together, it is practically certain that a certain number will have either recently suffered from typhoid or be in the incubation period thereof, it is easy to understand how an epidemic may arise. Captain Lalor therefore recommends the drastic measure of excluding absolutely from the camp any soldiers who have suffered from typhoid "within a period of two years previous." A roster of such men could, of course, easily be kept up in peace time. Next Captain Lalor advocates the thorough steam disinfection of all blankets, bedding and clothing which the regiment takes with it into camp. The lecturer believes that if these measures are thoroughly carried out that regiment will start free of any infection from enteric, but of course to be effectual such precautions must be taken not by one regiment but by all bodies of troops starting on the campaign.

The second measure of prevention is the provision of a pure water-supply. Captain Lalor strongly advocates the Washington-Forbes steriliser, which our readers can find fully described in Munson's admirable volume on "*Military Hygiene*," which every military medical officer ought to have and study. The U. S. Army pattern weighing only 90lbs. and delivers 25 gallons of cool sterilized water every hour. For the storage of water, Captain Lalor has invented a iron receptacle, or water-drum, the side of which is so recessed that the tap is protected from being damaged, a necessary precaution, the lid is hinged on and provided with a hasp for padlock. Such a receptacle will prevent the ingress of dust and flies and contamination by dipping vessels into the water.

Captain Lalor then describes how manual contamination of food can be prevented. Kitchen refuse, wet and dry, should be cremated in an apparatus such as Cowley's camp crematory, which weighs 900lbs., but can be packed up or set up again in a few hours. Such a crematory will destroy the garbage of an entire brigade.

The third point to be attended to is the prevention of soil contamination, and the resulting appearance of the fly pest. For this there is nothing so useful as an incinerator. The appearance of flies in a camp is an evidence of soil contamination. For camp latrines Captain Lalor recommends an improvement on the Chinese method of excreta disposal. This is a large cemented tank with openings immediately over—in fact crude "septic tanks." It is stated that if such a cemented tank be but dark enough and deep enough flies will not meddle with it. For temporary latrines Captain Lalor advocates a fly proof "necessary tent."

At the close of his lectures Captain Lalor advocated the training of a small body of regimental sanitary police, who should be taught their duties and should obtain certificates, just as at present officers and men obtain "transport" certificates.

Captain Lalor's lectures are most interesting, and we believe that much good could be done by the institution of similar lectures by medical officers in all cantonments.

SEWAGE DISPOSAL.

We quote the following paper on sewerage and sewage disposal from an account of a Meeting of the Association of Municipal Engineers held at York in May last. The paper is by Mr. A. Creer, the City Engineer of York:—

Various standards of purification, or rather of impurity, have been sanctioned provisionally by Rivers Boards and County Councils, and tacitly acquiesced in by the Local Government Board. In this district it has been fixed at one grain of oxygen absorbed per gallon, and one-tenth of a grain of albuminoid ammonia per gallon. These varying standards have obviously been fixed by the various Rivers Boards and County Councils to suit the different conditions that obtain in their respective districts.

In the writer's opinion no standard can be a fair and equitable one if fixed arbitrarily, and without any reference to local conditions, and to the proportion the volume of effluent bears to the volume of the stream or river into which the effluent discharges. It is obviously unfair to fix upon the same standard for an effluent discharging into a river with a minimum flow of fifty volumes of effluent, as for an effluent which forms in itself the bulk of the volume of the stream into which it is discharged. In the latter case a non-putrescible effluent should be insisted upon, but surely in the former some latitude should be allowed; if it is allowable to run crude sewage into a tidal river it should surely be allowable to discharge an effluent purified to a limited extent into a river of greater volume than many a tidal river.

What the results of the labour of the Royal Commission on sewage disposal may be it is difficult to forecast. We must possess our souls in patience and hope that it may be a rational solution of the problem, moderate and reasonable in its requirements, and with a certain amount of elasticity in its working that will commend it to the majority of municipalities.

Many towns have, during the past twenty years, spent vast sums of money on works for the chemical precipitation of sewage and its attendant evils of sludge pressing and disposal of cake; they are now in the position of having to begin practically over again and incur additional debt before the loans for the first expenditure are liquidated. This is a matter of very serious moment, and one that should be very seriously considered by the Local Government Board when laying down hard-and-fast lines for municipalities to follow.

I have in mind a certain place in Yorkshire where the sewage purification problem has been shelved from time to time by the authority; they are now in much the same position as they were thirty years ago; they have incurred little or no expenditure on works, and are now in that happy position of knowing that their policy of letting things slide has resulted in the saving of large sums of money; while those municipalities who have honestly tried to deal with the problem regardless of cost are in the unfortunate position of seeing their works practically condemned, and looming in the future further large expenditure on works that may turn out to be as futile and unsatisfactory as those they had but a few years before carried out under pressure.

It is this uncertainty that the Royal Commission should end. Works carried out with the approval of the local Government Board, on lines laid down by them, should, if carried out, suffice at least for a period sufficient to enable the authority to pay off the debt incurred in their construction.

[The author then gave some particulars as to the cost of the York sewerage works, and also the results of experimental works carried out during the last five years, at the conclusion of which he said:—]

There are a great many points in connection with the bacterial system of sewage purification on which it is desirable that we should have definite and reliable information, so that in designing a scheme the different parts should be so proportioned that the best results may be obtained at the least possible outlay. It has occurred to the writer, and, doubtless, to most of those present, that the most efficient length for a septic tank is a factor that it would be desirable to have definitely settled; there are, however, so many conditions to consider that it is only by contributions to a common stock of knowledge that we can hope to arrive at a safe conclusion.

As a small contribution on the subject, the following information my be useful.

Two tanks, each 164ft. long by 40ft. wide, have been used as open septic tanks, the flow from the first passing through the second. The velocity of the flow for some days before and after the observations to be referred to was ·28ft. per minute, or 16¾ft. per hour, and the quantity passing 628,000 gallons per twenty-four hours.

Samples of the flow were taken at the inlet (raw sewage), and at various distances between the inlet and the outlet, where it passed to the continuous filters. The results are given in the table below.

It would appear with a sewage of the composition given, with a velocity of ·28ft. per minute, that no adequate progress in purification was effected after flowing through the tank for a distance of 225 ft.; the items of oxygen absorbed and albuminoid ammonia remaining stationary during the further flow of 100 ft. It will be observed that there was a continued reduction in the free ammonia and solids, both mineral and organic, but this reduction would not be sufficient to warrant the construction of a longer tank.

Analysis of Septic Tank Contents taken on March 15th, 1904.

Distance from sewage inlet.	Free ammonia.	Albuminoid ammonia.	Oxygen absorbed.	Total suspended solids.	Mineral suspended solids.	Organic suspended solids.
ft.						
0	2·555	0·865	3·160	34·3	8·	25·94
18	1·435	0·595	2·67	30·13	8·4	21·7
72	1·400	0·560	2·43	28·0	7·7	20·3
102	1·085	0·420	2·43	25·9	7·0	18·9
132	1·260	0·420	2·31	22·4	6·3	16·1
195	1.575	0·385	1·944	21·0	4·9	16·1
225	1·575	0·315	1·6	20·3	4·9	15·4
255	1·260	0·315	1·6	17·5	4·9	12·6
303	1·190	0·315	1·6	14·7	3·85	10·85
326	1·190	0·315	1·6	14·35	3·85	10·5

It is evident that this tank does something more than liquefy the organic solids, as the sewage on this occasion was purified during its progress through the tank to the extent of about 50 per cent. both in oxygen absorbed and albuminoid, and it is evident that this improvement is not confined to the later period of its flow through the tank, as the percentage of purification is greatest in the first 18ft. of flow, gradually diminishing as it proceeds until it reaches a point when a further flow of 100 ft. fails to effect any further improvement in the sewage; the inference is that both anaërobic and aërobic bacteria are working throughout the whole effective length of the tank, and that when a certain stage of purification has been reached a different process is required to carry on the work. The difference in the extent and rapidity of the purifying process is very marked when passing through the filter. In the last 100 ft of flow through the tank the sewage has evidently remained in a comparatively stable condition—no purification took place—whereas in the fifteen minutes taken to pass through a depth of 6ft. 9in. of filter the purification increased to 72 per cent., bringing up the total purification by tank and filter to 86 per cent.

The strength of the sewage on this occasion was very much below what usually obtained. The average strength of the sewage during the past six months has been 6·44 grains per gallon oxygen absorbed.

The action on the suspended solids is very interesting; of the total quantity entering the tank with the sewage 75 per cent. was organic and 25 per cent. mineral. On leaving the tank the suspended solids had been reduced to 58 per cent., and this was composed of 73 per cent. of organic suspended matter, and 27 per cent. mineral; this approximates very closely to the proportions in the raw sewage.

Similar observations taken over ten hours on October 6th, 1903, when the sewage showed 9·73 grains per gallon oxygen absorbed, tend generally to confirm the results above described so far as the purification is concerned. The velocity was 0·105ft. per minute, or 6·3ft per hour, and the quantity passing through 238,000 gallons per twenty-four hours. As in the former case there was no reduction in the oxygen absorbed during the last 100ft. of flow.

With this velocity 92 per cent. of total suspended solids were deposited in the first 18ft., *i. e.*, in the grit chamber, while in the former case, with a velocity of ·28ft. per minute, only 58 per cent. of the suspended solids were so deposited. The suspended solids in the sewage on this occasion comprised 52 per cent. organic and 48 per cent. mineral. The total solids were reduced during the flow through the tank to 8 per cent., and this was composed of 75 per cent. organic and 25 per cent. mineral, so that, notwithstanding that the sewage in the latter case contained nearly three times the quantity of suspended solids and a velocity through the tank of only 6·3ft. per hour, as against 16¾ft. in the

former case, the proportionate results on leaving the filter were practically identical.

Temperatures.—A large number of observations have been taken of the temperature of the sewage, filter bed, filtrate and atmosphere during the past three years. Shortly the results are as follows:—In the winter the sewage averaged 8 deg. above the atmosphere, the filtrate 3 deg. below the sewage. The filter itself averaged from 2 deg. below the sewage to 1 deg. above, the lower temperature being in that part of the filter nearest to the outside wall.

Aëration.—There can be little doubt that this form of filter wholly above ground lends itself admirably to through aëration. Observations have been taken at the openings in the pigeon-hole wall at the termination of the perforated pipes by means of an anemometer; the results show that, notwithstanding the numerous openings for the admission of air into the filter, the velocity on the windward side varied from 350ft. to 1050ft. per minute, while on the lee side it varied from 550ft to 1240ft per minute from the filter, sufficient to satisfy the most voracious microbe.

ORIENTAL SORES.

Our correspondence columns have recently referred to Dr. Wright's researches into the parasite of the sore which under many names is well known in many parts of India. It may be remembered that Capt. James has pointed out that, in the opinion of some observers, this parasite is morphologically identical with the organism now known as Leishmania Donovani which the recent researches of Leonard Rogers show to be a stage in the life-history of a trypanosome. We, therefore, quote a description of Dr. Wright's work:—

"Wright, J. H. Protozoa in a case of tropical ulcer, the *Journal of Medical Research*, vol. x., No 3, 1903, December. After referring to the investigation on the subject of tropical ulcer, frequently referred to as Delhi boil, Aleppo boil, &c., by D D. Cunningham (On the Presence of Peculiar Parasitic Organisms in the Tissue of a Specimen of Delhi Boil." *Scientific Memoirs by Medical Officers of the Army of India*, Part I., 1884, Calcutta, 1885); by Gustav Riehl (*Zur Anatomie und Ætiologie der Orientbeule, Vierteljährsschrift für Dermatologie und Syphilis*, 1886, p. 805); and by R. H. Firth ("Notes on the Appearance of Certain Sporozoon Bodies in the Protoplasm of an 'Oriental Sore'," *British Medical Journal*, 1891, January 10), Wright gives a description of his investigation in this disease The lesion consists of single or multiple focal lesions of the skin, characterised by the formation of elevated indurated areas, which ulcerate and eventually cicatrise In smears from the excised tissue of the sore fixed and stained in various ways, Wright found peculiar parasitic bodies to which he attributes the origin of the ailments He proposes to call the parasite he met with *Helcosoma tropicum* and rejects the name *Sporozoa furunculosa* given to the bodies by Firth. The preparation of the staining fluid, and its application to smear preparations from tropical ulcer used by Wright, is as follows:—

"*Preparation of the Staining Fluid*—Dissolve 0 5 grm. of sodium bicarbonate in 100 cc.m. of distilled water, and add to it 1 grm. of methylene blue (Grübler). Steam the mixture in an ordinary steam steriliser for one hour, counting the time after 'steam is up.' The heating should not be done in a pressure steriliser, nor in a water bath, nor in any other way than as stated. When cool, pour the mixture into a large vessel and add to it, stirring or shaking meanwhile, 500 cc.m. of a one to one thousand aqueous solution of eosin (Grübler, yellowish, water soluble). In the mixture thus formed a fine blackish precipitate will be visible in suspension, and on the surface a scum with yellowish metallic lustre will have appeared. Filter the mixture, collect the precipitate on the filter paper and allow it to dry thereon without washing. When thoroughly dry, dissolve this precipitate in pure methyl alcohol in a proportion of 0·5 grm. to 100 cc.m. of alcohol. This alcoholic solution is the staining fluid. It will keep indefinitely, as will also the dry precipitate Precautions should be taken to prevent the alcohol from evaporating, for thus the solution may become too saturated and precipitates may form on the preparation in the process of staining. If the staining fluid deposits such precipitates it should be filtered and a small quantity of methyl alcohol added to it."

"*Method of Applying the Staining Fluid.*—Place the fresh cover-glass preparation in pure methyl alcohol and allow it to remain therein for two or three minutes. It is probably best that the preparation be allowed to dry in the air before placing it in alcohol. Next remove the preparation from the alcohol, grasp it with cover-glass forceps and, without permitting it to dry, pour on to it as much of the staining fluid as the cover-glass will conveniently hold, and allow the fluid to remain one minute. Then add water to the staining fluid drop by drop until a delicate scum with iridescent metallic lustre becomes visible on its surface. Avoid diluting the fluid more than enough to just cause this scum to appear. If the staining fluid has been properly prepared, this scum will form before the fluid has been diluted enough to be transparent. The diluted fluid is to remain on the preparation for three minutes. During this time the most important part of the staining is effected After this the preparation is to be washed with water until the nuclei of cells in the better-spread portions of the preparation appear well differentiated under a low power of the microscope and until any red blood corpuscles present have a yellowish or pinkish colour. This will probably require about a minute's washing. The washing in water is important, for it removes superfluous blue stain and brings out the differential staining of the elements in the preparation. Distilled water should be used, for tap water may spoil the staining. The quality of the staining and the progress of the differentiation can be easily judged by placing the preparation, film side uppermost, on a slide and examining it with a Zeiss AA or similar objective. When the decolourisation is judged sufficient, the preparation is to be thoroughly dried and mounted in balsam. Dried stain adherent to the upper side of the cover-glass may be easily removed with alcohol. The nuclei of cells should have a blue or deep lilac colour and red blood corpuscles a pink or orange colour The cytoplasm of polynuclear leucocytes should show lilac-coloured granules and the cytoplasm of lymphocytes should have a robin's egg blue colour, while the protoza should have the colour appearances described"

Microscopical examination of paraffin sections of some of the material which had been fixed in Zenker's fluid gave the following results: The lesion consists essentially of a very extensive infiltration of the corium and papillæ by cell, accompanied by atrophy and disappearance of the epidermis of the part. The infiltrating cells are plasma cells, various kinds of lymphoid cells, and large cells with single vesicular nuclei and a relatively large amount of cytoplasm in which are large numbers of the micro-organisms. These large cells, over extensive areas, are very numerous and constitute the principal part of the infiltration. They are regarded as proliferated endothelial cells. The micro-organisms are generally closely packed together throughout the cytoplasm of these cells, and occupy most of the available space between the nucleus and the cell membrane. They are almost exclusively in these cells Many cells contain twenty or more micro-organisms. Only in very thin sections can the morphology of the individual micro-organisms be clearly made out. In these thin sections all the micro-organisms appear to be

of spherical form, the cortical or peripheral portions staining faintly with nuclear stains and the principal portion of the body remaining unstained, while the larger and smaller lilac-stained masses described in the smear preparations stain deeply with methylene blue and gentian violet.—*Jour., T. Med.*

PIROPLASMOSIS.

THE April issue of the *Journal of Hygiene* contains two articles on canine piroplasmosis, or what is known as malignant jaundice in the dog. In view of the article we recently published by Dr. Lingard and Major E. Jennings, I.M.S., it will be of interest to extract some of Dr. Nuttall's article, which shows the widespread geographical distribution of this infection.

The diseases produced by parasites of the genus Piroplasma appear to closely resemble each other. Bovine piroplasmosis is one of the best known of this group. It has been observed over a large area of North and South America, in Australia, Africa (Algiers, Egypt, Uganda, Cape Colony, Cameroon, German E. Africa). In Europe it occurs in S.-W. Russia, Bulgaria, Hungary, Roumania, Turkey, Italy, Sardinia, France, Finland, Norway, and "there is reason to believe in parts of Great Britain. In all cases the disease had been found associated with the presence of ticks on the affected cattle. The species of tick known as *Rhipicephalus Aunulatus* (Say.) was proved by Smith and Kilbourne to transmit the disease. We are not aware what species of tick is concerned in the transmission of this parasite in Indian cattle, but Ixodes reduvius plays the part in Europe. Bovine piroplasmosis is perhaps best known as Texas Cattle Fever, but has also been called, Tick fever, Blackwater, Redwater, *mal de brou*, malaria bovina, &c., &c.

The parasite also attacks sheep, and this form of piroplasmosis was first observed in Italy (Babès), and afterwards in Turkey, France, the West Indies and S. Africa. Equine piroplasmosis has been observed in S. Africa, in Germany, and it is said also in Venezuela. Human piroplasmosis we have learned by Lingard and Jennings' paper may be a common disease in India, and Dr. Nuttall conjectures that what is known as the spotted Fever of the Rocky Mountains may prove to be this disease (see *Indian Medical Gazette*, May 1904, p. 191). This disease is apparently transmitted by a tick (*Dermacentor reticulatus*), the same species which in France is suspected of conveying piroplasma canis.

We note that Dr. Nuttall agrees with Ronald Ross and Manson in considering that the parasite described by Leishman and Donovan belongs to a different genus, hence he prefers the name *Leishmania donovani, to that of piroplasma donovani.*

As the disease is likely to prove to be a human one, it is well to know the methods by which the disease is transmitted in other animals. The following is Dr. Nuttall's description as regards canine piroplasmosis or what Hutcheon called "malignant jaundice or bilious fever of the dog." In Africa the tick which conveys the *piroplasma canis* is the species Hæmophysalis leachi (Audouin). "To be infective a tick must be descended from a mother tick, which has sucked the blood of an animal affected with the disease. After the parent has gorged itself with blood, she falls to the ground, and after a variable time lays a large number of eggs from which hexadod larval ticks issue in due course. The larval ticks attack a dog when they have the opportunity, fill themselves with blood, and after about two days fall off. According to the observations of Lounsbury these infected ticks do not transmit the disease. After lying in the ground for a variable length of time the larval skin is shed, and the eight-legged nymphal tick issues forth. Lounsbury has also been unable to show that the nymphal tick is infective. The nymph in turn attaches itself to a dog, for a few days, and having gorged itself with blood drops to the ground. Here it undergoes its metamorphosis, as did the larva, and after this is accomplished it casts its nymphal skin and issues an adult (sexually mature eight-legged tick.) It is the *adult* tick, and *only* the adult, which transmits the parasites, according to Lounsbury." Surely this is one of the "fairy tales of science," more remarkable even than the development of the parasite of malaria in the mosquito and in human blood.

The symptoms of this infection in the dog are fever, loss of appetite, increasing weakness and loss of weight ending in complete helplessness. The mucous membranes become pallid, and icteric. In some cases hæmoglobinuria occurs, and in chronic cases the urine is albuminous. The disease may be acute, ending fatally in three or six days, sub-acute, ten days, and chronic cases may last as long even as 62 days. The spleen is usually enlarged, and the liver congested.

All of our readers who are interested in the subject of piroplasmosis should read Dr. Nuttall's article (*op. cit.*) from which we have quoted above.

ANTIMALARIAL SANITATION IN INDIA.

THE concluding portion of the account written by Lieutenant-Colonel Giles, F.R.C.S., I.M.S. (*retd.*), of his cold weather tour in India is devoted to a *résumé* of what might be done to reduce the amount of malaria in India.

Now in the first place we may remark that it is possible to exaggerate the mortality attributed to malaria in India. In the first place the statistics of the general population are notoriously unreliable when they deal with death from fever, that is, we have no right to attribute all this mortality to the malarial parasite.

This will be admitted by all. Again, the tendency of recent research is toward showing that much of what we have hitherto been obliged to call "malarial cachexia" is due to an altogether different blood organism, and if we deduct the heavy death-rate attributed to so called chronic malaria and cachexia we shall largely reduce the number of deaths to be attributed to real malaria.

We will admit that after allowing for the above considerations there still remains very large amount of preventible sickness from malaria, and that it is our duty to devise the best means of combating this.

Colonel Giles points out the zeal of medical officers here and there is not sufficient, unless backed up by funds from Government, to do much to reduce the amount of malaria; he is also "entirely sceptical as to the possibility of producing any marked effect in the number of mosquitoes in Assam, Burma and Lower Bengal or in localities under canal irrigation." He scores a point where he shows that "alike in our Civil and Military hospitals, no attempt whatever is made to separate malaria patients from those suffering from other diseases."

Again, while in Italy it is illegal for engineers to leave undrained barrow pits alongside of a line, in India such pits are left everywhere, at the random will of the contractor, and without much reference to either neatness or sightliness. Colonel Giles admits that "the active opposition and ridicule which met the earlier attempts to convince the public of the possibility of preventing malaria" have greatly ceased, but still they are few signs to show that the Anglo-Indian public may be educated into taking precautions against malaria—"While they blaspheme at the swarms of mosquitoes they maintain in their gardens convenient breeding places, that would suffice to supply a decent-sized town."

Colonel Giles concludes the really interesting and valuable account of his *Wanderyarh* by advocating the closing in of the too numerous doors of the Indian bungalow in the plains with wire gauze. In the first place we may all agree that many of the doors of the ordinary Indian bungalow are quite unnecessary for traffic. These bungalows are all built on some plan which must have been devised by the P. W. Department of the 18th Century. Most of these doors might well be closed by wire gauze screens. Colonel Giles next proposes the enclosure of the verandahs in the same way, and that all doors used for traffic should have double, that is, inner and outer, spring doors. The ordinary Anglo-Indian official would probably like well enough to be left in a station long enough to justify the expenditure necessary to make his house insect proof, which Colonel Giles estimates to cost about 390 rupees. It may at once be admitted that the cost is not too much for the comfort promised. The objections that strike one are that these gauze screens must to a considerable extent obstruct the fresh air and the breeze. It is probable that this is more possible in Italy than in India. But there is no reason why one should not have, say one verandah, and one bed-room thus protected. This is at any rate worth trying.

THE SERUM REACTION IN TYPHOID.

In an admirable article on the diagnosis of Enteric Fever (*Practitioner*, March) Dr. Claude B. Ker, the Superintendent of the Edinburgh City Hospital, discusses the value of the serum-reaction test. He points out that though it is not to be relied upon in the early days of the fever, it is wonderfully accurate in finally settling the nature of a case. Dr. Ker admits that he has met with physicians of experience who profess little faith in this test; and attributes this to the fact that it is too often carelessly performed. He uses a one in thirty dilution, and "after seven years' experience" (writes Dr. Ker) "I regard the test as practically infallible, if it is employed with proper precautions, although it is frequently absent even in the second week of the fever." In a series of 1,159 specimens of blood examined(all hospital cases under his own care) Dr. Ker has had only 18 questionable results, a margin of error of well under two per cent. In the 85 cases which came to the *post-mortem* table the reaction was found accurate in all; of 28 cases which gave a negative reaction none had any enteric lesions when examined *post-mortem*.

He concludes as follows:—

"A positive reaction means that the patient has enteric fever at the moment, or else suffered from that disease previously. It is well now-a-days to inquire also whether the patient was even vaccinated against typhoid. A negative reaction in the first fortnight means little or nothing. If, however, it is still negative in the third week there is a strong presumption against a diagnosis of enteric. Should a negative reaction be still obtained after the third week is over for practical purposes the idea of enteric may be dismissed. It will be seen that for the consolation of those of us who regret what might almost be called the emasculation of clinical diagnosis by bacteriology, the test, finally accurate as I believe it to be, leaves plenty of time for the exercise of our clinical abilities.

REPORT ON HYDRO-CARBON AS A DISINFECTANT.

We have received the following from the King Institute of Preventive Medicine, Guindy, Madras; it is written by Lieut-Col. W. B. Bannerman:

"Dr. E. S. Chenai, the Chief Medical Officer, Southern Mahratta Railway, having reported that "disinfection by hydro-carbon is most thorough and more reliable than that done by perchloride of mercury or any other

disinfectant,"* it became important to examine this substance in the laboratory; especially as the evidence on which this opinion is based appears to be derived only from nine experiments on Railway quarters in various places on the Southern Mahratta Railway line, and Dr. Chenai himself allows that he knows of no bacteriological evidence either for or against it. From the statistics given in regard to these places, it is impossible to get more than a general idea of the effects of hydro-carbon as no control experiments were made in these groups of buildings, but a contrast merely drawn between the case incidence in the Railway quarters and the other dwellings in the neighbourhood. It is hardly necessary to point out the fallacies involved in such comparisons.

The method employed to test the hydro-carbon was as follows:—

An emulsion of staphylococcus albus of 24 hours' growth was made with sterilized distilled water. This was added to the hydro-carbon dilutions; and one loop-full of the mixture removed at the required intervals and added to 10 c c of melted agar at 42 C. This was then plated in a sterilized Petri dish in the ordinary way, and subsequently incubated at 37 C. for 48 hours. A count of microbes was then made.

As it was proposed to contrast the action of hydro-carbon with that of percloride of mercury, the first experiments were made with dilutions ranging from 1 in 500 to 1 in 3,000.

The time the test organisms were left in the solutions was ½ minute, 1 and 2 minutes

The hydro carbon had no effect whatever on the staphylococcus in any of these cases, though perchloride of mercury 1 in 1,000 killed all the organisms in less than half a minute.

A second series of experiments with dilutions of hydro-carbon of 1 in 50, 1—100, 1—200 and 1—300 yielded similar results.

A third series of experiments with dilutions of 1—1, 1—5, 1—10 and 1—20 gave again the same result, *i.e.*, innumerable colonies were present in all the agar plates.

Finally pure hydro-carbon was used, and loop-fulls removed after the staphylococcus emulsion had remained in it for ½, 1, 2, 5, 15 and 30 minutes respectively.

The plates made from the first three showed the usual abundant colonies, as also did the last, but the plates made at 5 and 15 minutes were sterile.

Another trial however made after more careful shaking of the test tube, showed abundant colonies in all the plates. The difficulty of keeping the staphylococcus emulsion from sinking to the bottom probably explains the sterility of the plates made at 5 and 15 minutes in the first attempt with the undiluted hydro-carbon.

It would appear then that hydro-carbon is useless as a disinfectant when used in the same way as solutions of mercury are.

2 An experiment was made in an ordinary servants' godown, to ascertain the disinfecting power of the ignited hydro-carbon.

The room measured some 14' by 6' with tiled roof and one door.

Two gallons of liquid hydro-carbon were poured on the floor and lower part of walls by means of an ordinary gardener's watering can. A light was applied and a most startling conflagration immediately ensued, with flames pouring out of the doorway, and dense black smoke ascending in volumes through the roof far into the sky.

One can easily therefore understand that insects and rats in portions unsheltered from the flames and smoke, would be killed in numbers, but to imagine that the transient heat produced—for the flames subsided after about 2 minutes—would destroy microbes in the floors and walls seems contrary to all the experiments of Parsons (L.G.B. Reports for 1894) and of the more recent ones made by Lamb in the Plague Research Laboratory, Parel, and Srinivasa Rao at Bangalore when testing the action of dry heat produced by "Sawney's dessicator."

All the experiments made by these investigators point to the extreme uncertainty of radiant heat as a destroyer of germs. That this was the result of the transient conflagration produced by the hydro-carbon is proved by its failure to sterilise staphylococcus growths in agar tubes disposed about the godown. Even the tube close to the floor, the glass of which was broken by the heat, showed no signs that the agar contained in them had even been softened by it.

The conclusion therefore seems to be that hydro-carbon as a destroyer of germs is a failure.

3. Four rats were procured and placed in an ordinary three-division iron and wire rat cage.

Hydro carbon was poured on to the shelf of the central compartment. The strong odour did not appear to incommode any of the rats. The one living in the compartment jumped up on the shelf, and actually licked some of the hydro-carbon from the floor

After waiting some considerable time the rat was caught and held up by the nape of the neck. Its mouth was opened and some hydro-carbon poured in. In doing this some of the fluid flowed over its head and into its eyes and down the front of the abdomen.

It was then replaced in its cage. After a few minutes it fell over on its side, the hind legs appearing to be partially paralysed. It was removed from the cage and allowed to lie on the ground. After a few minutes of quiescence it struggled to its feet and feebly walked off. Some water was offered to it and this it greedily drank. In the course of half an hour it was apparently all right and at the time of writing (24 hours after the experiment) is as lively as ever and perfectly well.

A second rat had hydro-carbon sprinkled freely over it through the top of the cage, so that the fur became quite wet. This did not appear to cause much distress to the animal which commenced to clean itself by licking its fur in the ordinary way.

This animal, as well as two others, freely exposed to the disgusting fumes of hydro-carbon still survive.

It would therefore appear that hydro carbon as a rat poison is not a success.

THE Government of the United States have started the new Laboratories in Manilla for the investigation of the tropical diseases of man and animals at a annual cost for salaries alone of over 50,000 dollars.

THE following description of the Reference Library in connection with the new Laboratories in Manila will make many of our readers wish we had anything so good in India:

"A necessary feature of scientific investigation is an adequate reference library, and it goes without saying that the bureau of government laboratories must be equipped with such an adjunct to work. The building plans have reserved a space in a central location which will be capable of easily accommodating 30,000 volumes. By means of subscriptions to scientific periodicals, the gradual accumulation of complete sets as funds are made available, and by the purchase of modern manuals, it is hoped in the course of three or four years to have a working library sufficient to meet the demands which will be made upon it This plan contemplates provision for biological (including medicine), chemical, pharmacological, pharmaceutical, toxicological, and physical literature, together with the necessary works on botany and zoology not especially provided for in those bureaus

* Notes on Hydro-Carbon as a Plague Germ Destroyer by Dr. E. S. Chenai, L.R.C.S. (Edin.), etc., Chief Medical Officer, Southern Mahratta Railway, 1904. Printed at Southern Mahratta Railway Company's Press, Dharwar, April, 1904.

having botanists and zoologists under their immediate direction.

"The library will not be solely for the private use of the laboratory, but will be open to such of the public as care to avail themselves of its privileges under the library rules which will be adopted. The inestimable advantage to the medical profession of the Philippine Islands, of an adequate library, alone would justify the expenditure, apart from all other considerations, and when in addition the library will furnish all the working material for the bureau of government laboratories and a large proportion of the allied bureaus, its absolute necessity will at once become apparent. A competent librarian will be engaged and modern methods of cataloguing will be adopted as soon as a sufficient number of books are on hand to warrant the expense. At the present time, no library room is available in the temporary building, and an addition to the present quarters is necessary at the earliest possible moment."

In an article (*Practitioner*, May) Dr. Sandwith, of Cairo, emphasises what is well known in India, that relapsing fever, in spite of its synonym "famine fever" has but little to do with starvation. "Relapsing fever did not occur among the starving refugees during the Madhi's rule in the Sudan." Its etiology is like that of typhus and plague,—overcrowding, bad ventilation and uncleanliness. It may be noted that the parotid buboes, well known in Bombay cases, appeared in a few Egyptian cases.

The *Practitioner* thus sums up. Dr. A. E. Wright's last article on antityphoid inoculation:—

"In our present number Dr. A. E. Wright concludes his series of articles upon the subject of protective inoculation against enteric fever. The table of statistics which accompanies the present article tells very conclusively in favour of the use of the inoculation-method in the case of this disease, the death-rate being distinctly lower in the inoculated than in the uninoculated in almost every instance. It cannot be concealed that there are grave drawbacks to the method of vaccination in the severity of the symptoms which are induced by the procedure, and these objections will no doubt be sufficient to act as deterrents to many who would otherwise avail themselves of the protection afforded. It seems that the Medical Advisory Board which presides over army medical affairs is not favourably disposed towards a continuance of inoculation among our troops In face of the evidence presented by Dr. Wright we do not think that it would be justifiable to do away altogether with facilities, for those who are so disposed, to obtain the benefits of vaccination against enteric fever. On the other hand, it would be still less justifiable to make the inoculation universally compulsory, as is the Jennerian vaccination against small-pox. The two diseases are not similar in nature. Small-pox, as a rule, protects those who have once suffered from it against a second attack, whereas two attacks of enteric fever are not by any means unusual. Vaccination cannot in either case do more than actual infection; hence we could not in any case expect as great a degree of protection from antityphoid inoculation as from vaccination proper. But the evidence is in favour of its ability to afford some protection against the disease, if not to prevent it altogether; and we should be inclined to advise those who are likely to be brought into contact with the infection to submit to the temporary inconveniences of the inoculation, which in any case cannot do serious harm, and which may result in actually saving them from a fatal attack of enteric."

In an article (*Lancet*, May 14th) Dr. Walferston Thomas and Dr. Stanley Linton conclude that (1) the trypanosomes found in (*a*) cerebro-spinal fluid of Uganda sleeping-sickness cases, (*b*) of Congo Free State sleeping sickness cases, (*c*) blood of Uganda trypanosome fever cases, and blood of Congo State trypanosome fever cases, are all identical in animal reactions and morphology with *trypanosoma gambiense*. The specific name *gambiense* (Dutton) must therefore for the future include the trypanosomes from the abovementioned sources (2) there seems to be no acquired immunity against infection, (3) there is no transmission of immunity to offspring, (4) an animal which seems to have recovered may many months later show parasites once more, apparently as the result of lowered vitality.

It is notified for the information of all interested in and connected with the work of the St. John Ambulance Association, that the official store Depôt of that Association in India is at the Sassoon Institute Building, the Fort, Bombay, and is in charge of Mr. George Lund, the Honorary Secretary of the Bombay Presidency Centre, to whom application for stores should be made. Small stocks of stores are also kept up by the Bengal, Madras, Central Provinces, Baluchistan and Sind Centres, respectively located in Calcutta, Madras, Jabalpur, Quetta and Karachi.

The first Aid Manual has been translated into Gujarati Marathi, Urdu and Burmese; the Nursing Manual into Gujarati and Marathi.

In an editorial article on beri-beri (June 1904, p. 222) we suggested the working out of the extent to which the pulses are used in the dietary of persons or communities which suffer much from beri-beri. In confirmation of this hint we find in *Janus* a note to the effect that the issue of *phaseolus mungo* has been recommended as a prophylactic in the case of persons using rice largely in their diets.

Dr. Van Der Burg of Utrecht sums up our knowledge of the prophylaxis of beri-beri as follows:—

(1) A well-composed dietary.
(2) Variety in the nourishment.
(3) Plenty of fresh air in habitations.
(4) Sunlight and plenty of ventilation area.
(5) Removal of latrines to a distance from habitations.
(6) Avoidance of overcrowding in barracks and prisons.
(7) Regular exercise in the open air.
(8) Avoidance of excess *in Baccho et in Venere*.
(9) Beri-beri to be regarded as an infectious disease, and cases isolated accordingly.—*Janus*.

Opinion in India among those with much experience of plague is tending to the belief that plague attacks human beings *before* the rats are affected, *e.g.*, Lieutenant-Colonel W. G. King C.I.E., I.M.S., writes:—

"In discussing the above subject, it will be seen that I have ignored the question of rat infection in reference to either the spread of plague during epidemics, or their recrudescence. The fact that in a town where unsuspected plague exists, rats are first discovered dying or dead of plague has led to the belief that the infection of rats precedes human mortality. That this should be possible, especially with reference to grain infection, *where infected and uninfected areas are close together*, is readily believable; but such instances are extremely rare, and it may be fairly said that the appearance of dying of rats *before* the reporting by a local authority of the existence of plague amongst human beings, as a rule, implies neglect of duty of surveillance of the threatened population. Not only do I think that primary infection of a locality is rarely due to rats, but I also think that no instance of recrudescence due to infection of rats has been proved. Even in the midst of an epidemic, although undoubtedly there is a serious source of spread of infection amongst a free population, the area over which infected rats operate in a town is very limited. Possibly, rats, as in the case of monkeys, form separate tribes which have their own limited territory recognized by inter-tribal agreement, so that there is little intermingling of rats of various areas of the towns. Even when we come to the question of migration, the rats only of limited portions of a town are apparently involved."

An article in Journal A. M. A. (30th April) by Dr. Eugene S. Talbot, the well-known Dental Surgeon of Chicago, shows that the teeth and gum complaints so well-known in India are common in Panama. Dr. Talbot says the disease is not unlike scurvy, "the pathology and etiology at bottom being the same," *viz.*, "change of climate and of food." For treatment it is recommended that the gums should be massaged three times per day with a stiff brush" and the following applied daily, Zinc iodide 3 parts, water 2 parts, Iodine 5 parts and Glycerin 10 parts. It is noticed that the officers "who took better care of their mouths" largely escaped. Dr. Talbot calls the complaint interstitial gingivitis.

We learn from a note in *Janus* (May 1904) that smallpox was known and recognised in China so long ago as 1122 B. C. It is said to be a point yet undetermined whether India or China were the first to practice inoculation against smallpox.

In the year 1809, only a few years after the publication of Jenner's discovery cowpox was in high repute in China.

Reviews.

The Prevention and Check of Cholera—By Colonel Joshua Duke, I.M.S. (retd.). Calcutta: Messrs. Thacker, Spink & Co. Price 6 annas.

We are glad to see that Lieutenant-Colonel Joshua Duke, I.M.S., (retd.), has republished his useful little pamphlet entitled "*Precautions and Suggestions for the prevention and check of Cholera.*" This code of rules was originally drawn up by Lieutenant-Colonel Duke, when he was P. M. O. of the Punjab Frontier Force, and is based chiefly upon Mr. Hankin's valuable brochure called, "Cholera in Indian Cantonments." The pamphlet is written in clear and non-technical language, and is therefore well adapted for use by soldiers, municipal commissioners and other non-medical men. In fact, in times of cholera prevalence we strongly recommend that the attention of such persons be called to this pamphlet by Civil Surgeons, and military medical officers.

The little book begins by a short account of the cholera microbe and its behaviour. The disinfection of wells is advised by means of permanganate of potash (in quantity roughly one ounce for every three feet depth of water in the well), and for wells in Cantonments, Municipalities, or places where supervision can be exercised the improved method is advocated, *viz.*, to first add 5 lb. more or less, of the cheap "commercial" hydrochloric acid, before adding the permanganate. This should be followed by the pumping out of all water in the wells, before the well is again used. This is the only method which should be used in jails and such institutions. Colonel Duke also directs attention to the necessity of disinfected *mussucks*, earthen vessels, water-drums, &c. Brass and copper *lotas* can be best disinfected by fire or by filling them with hot ashes. We are glad to see that Colonel Duke recognises the real value of so-called "Cholera Camps" is not in the mere removal, but in the change in the supply of water usually involved by the removal from the place where cases of the disease have occurred. He also notes that the incubation period of cholera is usually from 48 to 72 *hours*, not the 5 to 14 days, which was formerly taught.

Good advice is also given for the cleaning of infected quarters. A mixture of fresh quicklime and chloride of lime should be used as follows: Five seers of fresh quicklime should be placed in a large earthen vessel and enough water added to slake the lime (this produces heat if the lime is fresh), then the mixture should be well stirred, and one pound of chloride of lime added. This *chlorinated lime-wash* is of value as a disinfectant; it is also a deodorant and by its smell keeps away flies. It is important to note that Mr. Hankin has declared that chloride of lime has a strong action on microbes, both in an acid and in an alkaline medium.

Floors which have been "leeped" with cowdung are best disinfected by burning straw on the floor, care being taken not to let the thatched ceiling or roof catch fire. We do not approve of the use of mere deodorants in latrines, they disguise the smell but do not remove the cause, they have however the advantage of discouraging flies, and for this reason "odorous disinfectants" may be used for covering up the dejecta of cholera or

dysentery patient, where such cannot at once be burned.

In conclusion, we strongly recommend this useful pamphlet to our readers, who will find many practical hints of value. Its low price, six annas, puts it in the reach of all.

The extra Pharmacopœia—By Martindale and Westcott. 11th Edition. 1904. London: H. K. Lewis. Med. 24 mo. Price 9*s.* 6*d.*

It is only three years ago since we welcomed the 10th edition of this invaluable little book, which is so well-known to every practitioner. Since then the originator of the book, William Martindale, has passed away. In the present edition his son W.H. Martindale, Ph.D., co-operates with Dr. W. Wynn Westcott in bringing out the 11th edition. We are glad to notice that instead of increasing in bulk this book has become smaller and more portable than ever. This has been achieved by cutting out subject-matter which was thought to be treated more fully than necessary in a manual of this nature. Many of the older drugs, chemicals and preparations have been omitted, and these omissions permitted the addition of more than 300 new remedies, and made room for a more detailed account of many useful therapeutic agents at present used in treatment. Therefore, though the size and weight of the little book have been decreased it actually contains 112 pages more than did the last edition. We need hardly say that we can strongly recommend this book, it is so well-known that the mere mention of the publication of an eleventh edition might suffice.

Manual of Surgery, Vol. II, Regional Surgery.—By Alexis Thomson, M.D., F.R.C.S. (Ed.), and Alexander Miles, M.D., F.R.C.S. (Ed.), Published by Young J. Pentland, Edinburgh and London, 1904.

The first volume on General Surgery was reviewed in the *I. M. G.* for May of this year. The second volume treats of Regional Surgery, is of the same handy size, has a wealth of excellent wood engravings, which are mostly original, and is printed in clear type on good paper.

As regards the choice of an anæsthetic, it is interesting to note that these two Edinburgh Surgeons express a preference for C. E. mixture, consisting of one part of chloroform and two parts of ether. They condemn the A. C. E. mixture on account of the two latter ingredients evaporating more rapidly than the alcohol, which saturates the lint or sponge and prevents the chloroform or ether being taken up. Curiously enough no mention is made of Junker's inhaler, an apparatus so commonly used in India on account of the economy of time and chloroform it effects. Moreover, it is not necessary to stop the punkah or electric fan when this inhaler is used, whereas the punkah or fan interferes seriously with the chloroform administered on a towel or cone.

In dealing with the accidents of anæsthesia, the authors make a much-needed distinction in the treatment of those who become pale as compared with that required for patients who get cyanosed.

There is a good chapter on appendicitis, in which both the acute and recurrent conditions are thoroughly discussed. We are glad to find the authors recommending Mr. Burney's grid-iron method of opening the abdomen as the soundest and safest for preventing a subsequent hernia. Their views as to when a surgeon should remove the appendix if he has any choice will also meet with general approval. They are not prepared to recommend removal of the appendix after a first attack in all cases unless swelling or tenderness persists a month after the attack, if the patient wishes to insure his life or to enter any of the public services, or if he resides beyond reach of surgical help, In children, also, it is probably better to operate after the first attack, because reccurrence is apt to be grave, and because of the acuteness of most inflammatory conditions in children. After a second attack the authors have no hesitation in operating, unless Bright's disease or diabetes exists.

The chapter on Hernia is well up to date, the dangers of taxis are clearly explained, and we are glad to notice Mr. Caird's invagination method preferred to excision in cases where gangrene of the gut is incipient or limited. As regards the use of opening medicine, the authors prescribe an enema on the morning after herniotomy, and a Seidlitz powder or mild laxative on the second day. The section on Hydrocele is somewhat incomplete and antiquated as judged from the standpoint of progress made in India on this subject. Very few operative procedures are described, and Pratt's eversion of the sac method is conspicuous by its absence. In like manner other subjects, such as stone in the bladder and prolapse of the rectum, which have received a good deal of attention in India, have not been dealt with as fully as we in India should like; but this is simply due to the limited experience of the authors and of European surgeons generally in these subjects.

The general plan of this volume is to deal first with the scalp, skull, brain, spine and cord, and the surgical injuries and diseases associated with them. Then come the face, pharynx, jaws, tongue, ear, nose, neck, salivary glands and thyroid; followed by the œsophagus, larynx, chest, breast, abdomen and pelvis, peritoneum, appendicitis, hernia, the stomach and intestines, the liver, gall-bladder, pancreas and spleen. After this we have pelvic swellings in the females, the rectum and anus, kidney and ureter, prostates urethra and male genitals. In all there are thirty-six chapters, comprising over seven hundred pages and 156 illustrations. Like the first volume this one can be recommended as a

reliable authority and text-book for practitioners and students alike.

Orthmann's Handbook of Gynæcological Pathology for Practitioners and Students.—Translated by C. Hubert Roberts, M.D. (Lond.), F.R.C.S. (Eng.), M.R.C.P., Physician to the Samaritan Hospital, London; assisted by Max. L. Trechmann, F.R.C.S. (Eng.), M.B., C.M. (Edin.), with 73 figs. London: John Bale, Sons & Danielsson, Ld. 1904. Pp. XV 127. Price 5*s.* net.

This book, as stated by the author in the preface, is intended for the assistance of those practitioners who undertake the histological examination of, or who in doubtful cases wish to be able to form an independent opinion on, specimens obtained in their gynæcological practice.

The first part of the work deals with the more important methods of microscopical technique, and includes the various means for the examination of fresh material, of hardening preparations, embedding tissues, staining micro-organisms, microscopical sections of tissues, etc., All the necessary formulæ and instructions being clearly, though concisely, given.

The second portion of the book is taken up with a description of the histological and pathological changes met with in the more common gynæcological, diseases, a short microscopical description preceding the microscopical one; the more common diseases of the vulva, vagina, uterus, tubes and ovaries being dealt with in turn. The description of the various appearances met with are fully and clearly given and should prove of the greatest assistance to those for whom the book is intended.

Not the least valuable portion of the work are the very beautiful illustrations of the microscopical appearances of the different diseases. These are all executed from the original plates of Dr. Orthmann's work in the German. We have rarely, if ever seen, better or more truthful illustration of microscopical sections.

The work of translation seems to have been most carefully carried out, and to be almost entirely free from the many objectionable features so frequently noticed in other works of the kind.

We think that all concerned are to be congratulated on having produced such an excellent book, which will fill a distinct want for a work of the kind in the English language—a want which, we believe, has been felt by many for some time past.

We can confidently recommend this volume to all those needing a clear, concise, reliable and up-to-date guide on the subjects contained therein, and it should certainly be in the library of all those who are interested in gynæcology.

Asthma in Relation to the Nose.—By Alexander Francis, M.B., B.C. (Cantab.), Adlard & Sons, London. 136 pages. Price 5 shillings.

In this little book, more than half of which is taken up by the description of cases, including the result of treatment on the lines practised by the author, there is a serious attempt to show that the ordinary view of an asthmatic attack requires modification in several particulars. The steps in his argument, which are well substantiated by facts, are these: Asthma is due to spasm of the bronchial muscles, which spasm is probably always induced by reflex action; asthma is not directly due to any *mechanical* obstruction of the nasal passages; the nose comparatively rarely supplies the immediate exciting cause of the asthmatic reflex; the chief cause underlying the asthmatic state is an unstable condition of the respiratory centre. His plan of restoring the stability of the respiratory centre is to cauterise that part of the nasal septum, which lies opposite to, and immediately above, the anterior third of the middle turbiated bone. He acknowledges that the procedure is empirical. It was found out by accident, and its effect was so striking that he tried it again, and finally used it as a routine form of treatment. The operation, which is performed under cocaine and resorcin, may have to be repeated, as may be gathered from the fact that in, 402 patients the operation has been done a total number of times amounting to several thousands without ill-effects, and with complete relief from symptoms to 300 of these.

Current Literature.

PIROSOMA DONOVANI.

Foreign Extracts.—M. M. Laveran and Mesnil report to the Academie des Sciences regarding the preparations, sent to them by Major Donovan, I. M. S., as follows: "From the 17th June to the 5th November 1903 Donovan found these bodies, on puncturing the spleen in 16 patients, who presented the following symptoms:—Enlargement of the liver and spleen, irregular fever paroxysmal œdema of the feet, with congestion of the lungs and in some cases subcutaneous hæmorrhages and ulcerations in the mouth. Treatment by means of quinine, arsenic and salicylate of sodium was in these cases without effect. The preparations which have been sent in liberal numbers to us by Dr. Donovan, have to do with several of thes casese, and besides smears of the spleen pulp they comprise smears of the liver-tissue which also contain the parasites....The parasite exists in the form of small pyriform, oval or spherical bodies, lying free, or within the red blood cells; the pyriform bodies, of which Ross had made no mention, being the most numerous in some of the preparations; their form reminds one exactly of the most typical specimens of the *Piro plasma bigeminum* of "Texas fever," and doubtless they represent the typical form of the human parasite which we are describing They measure 2·5—4μ in length by 1·5μ in breadth. In them, as in the oval and spherical forms, one can make out a chromatin-sphere—most probably the karyosoma—which is of considerable size, and in the pyriform forms lies usually towards the broader end. In the same transverse diameter there is generally found another mass of smaller size, round or rod-like, which is sometimes joined to the greater mass by a slender pedicle. The remainder of the contents of the parasite is finely granular and fairly clear. The peripheral red cells undergo a rapid change:

they become paler, do not, when stained, stain in the same degree as the normal xanthocytes, and become granular. A single xanthocyte contains from 1 to 7 or 8 parasites—one most usually—without being markedly enlarged; we have however observed a xanthocyte which contained 14 parasites and was nearly three times the normal size. Ross does not believe that endoglobular forms of the parasite exist; but we consider that it is hard to interpret otherwise the numerous figures which we have seen, and to which Donovan had drawn our attention, and which Ross had also seen. We would merely note that (1) some of the parasite containing cells still retained their normal reaction to staining, as a whole, or at the periphery; and (2) the quantity of matter outside the parasites is the greater the less the number of parasites, a fact which our hypothesis easily accounts for, but which is hard to explain by Ross' idea of "matrices in which spores are produced." Leishman agrees with us in admitting the existence of true endoglobular (intra cellular) forms And we would finally mention the fact that the parasite containing xanthocytes, which are absent in smears made *post-mortem*, abound in smears made *intra vitam* being the more numerous, the better the preparation. However the free forms are always more numerous than the intra-cellular forms. The fact that intra-cellular forms exist, leads us to believe that the parasites should be found, at a favourable moment, in the peripheral circulation. Donovan has informed us that he has not yet found them thus, and they were absent in a blood preparation which he sent us. In a considerable number of cases we have seen parasites, and always in a perfect state, within mono-nuclear and poly-nuclear leucocytes—their number varying. Some of these appeared to be within the nucleus of the leucocyte, and in these cases the nucleus had always undergone a change. The reproduction of the parasites appears to take place by fission into two or more parts—usually two, the great chromatin-mass becoming divided into two and the pyriform body, which has scarcely increased in size, splitting longitudinally; where fission into more than two parts occurs the parasite becomes spherical and undergoes a progressive enlargement, its nucleus soon undergoing division: We thus find bodies, whose diameter may be as great as that of a xanthocyte, and which contain 2, 3, 4, 5, or 6—and at most 8, large chromatin-masses, the small masses of chromatin being less numerous or altogether absent. Those bodies which contain 4—8 nuclei are very like xanthocytes containing so many parasites, and it requires a good deal of care to distinguish between them sometimes. Ross must have confused these two varieties. When their evolution is near its end, there apparently takes place a radial division of the parasite into mono-nuclear elements—certain rosettes, which we have observed appear to us to be thus caused. During the course of their evolution the parasites contain no pigment What place shall we give to this new organism. The almost constant presence of the smaller chromatin-mass, so like the leutrosoma of a trypanosoma, makes one of course think of that parasite, or at least of a flagellated parasite; but we have not been able to stain a flagellum, any more than Donovan or Ross have been able, and for this reason we consider that this hypothesis may be eliminated.

The facts which we have observed show that there is no essential difference between the Leishman-Donovan parasite and those piroplasmata which are already known to us—especially the typical *P. bigeminum*—the pear-shape and the longitudinal fission into two are the rule as in it, while the fission into 4 or more is sometimes found in the piroplasmata; and finally the existence of intra-cellular forms removes every objection to this view. We are forced then to retain the name *Piroplasma Donovani* which we gave to the parasite in our first note on it. *C.-R. Acad-des Sciences* tom. 13F, p. 95F. F. 12·03.].

Dr. Donovan has persevered in his researches, and he informs us that he has just found, in the peripheral blood of another case, intra-cellular forms which to his mind present a certain resemblance to those of the genus Piroplasma. It is only, he states, when the temperature has reached 39°—39·5° (102·2°—103·1°F) that these forms are seen, and in but small numbers Dr. Donovan has sent us, in proof of his discovery, several water-colour drawings and a stained preparation, in which we have been able to find the following:—The parasites are few in number—one has often to examine several fields, with a Verick Ocular No. 1 and $\frac{1}{12}$ immersion lens, to find one ball point. They are chiefly intra-cellular, but are also found free, and are small, smaller than those seen in smears from the spleen. Their form is that of a regular sphere or oval, their diameter being no more than 1—1·5μ, the karyosoma being small, rounded or elongated, and lying always at the periphery. In one xanthocyte we have observed two parasites till joined together—evidently the result of fission into two Unlike what is seen in the bodies from a spleen-smear, no accessory karyosoma is found lying beside the chief karyosoma; but it must be remembered that in the blood we have to deal with very young parasites, and we have already mentioned the fact that the nuclear structure of those bodies which are undergoing fission is simpler than that of those which have attained their full development. The xanthocytes which contain these small parasites have undergone no change, unlike what one finds in the case of xanthocytes containing more highly developed parasites, such as we find in smears from the spleen.

The small intra-cellular forms of *P. Donovani* bear a striking resemblance to the smaller forms of the malarial parasite; but there are certain points of distinction which to us appear sufficient to avoid confusion between the two: the smaller forms of the *hæmamœba malariæ* contain vaculated nuclei whose structure differs from those of *Piroplasma Donovani;* and the karyosomata of the former do not resemble those of the latter parasite, while together with the small forms of the former are found larger bodies whose volume is markedly greater than that of *P Donovani*, as found in the general circulation. Nor will *P. Donovani* be taken for hæmatoblasts, whose contour is less distinct, and whose karyosoma is hardly distinguishable from its protoplasm, unlike that of the parasite.

This Indian piroplasm-caused fever appears to be fairly prevalent in the Madras region, for in the 6 months during which Donovan has specially studied it, he has met with 23 cases. The mortality caused by it is very great, the patients being generally affected with diarrhœa towards the end of the case. Ross and Donovan were struck with the resemblance between this disease and *kala-azar*, or black fever of the Brahmaputra valley, whose etiology had not yet been made clear, having been ascribed to Anchylostomiasis by Giles, to Malaria by Ross and Rogers, to Malta fever by Bentley, and to a special as yet undiscovered parasite by Manson. On the 23rd December 1903, Dr. C. A. Bentley telegraphed to Dr. Donovan as follows:—"Bodies resembling those described by Leishman and you found during life in *kala-azar*," which telegram Dr. Donovan has been kind enough to communicate to us. *Piroplasma Donovani* is, then, the cause of a febrile disease which is widely spread throughout India.

W. D. S.

ANNUAL REPORTS.

RAJPUTANA ANNUAL REPORT, 1902-03.

This Annual Report for year ending 31st March 1903 was forwarded to the Government of India in November 1903, it was written by Lieutenant-Colonel H. N. V. Harington, I.M.S., in June 1903. It only reached us in end of May 1904. It is satisfactory to note that there was a marked recovery on the part of the people throughout Rajputana from the depression caused by previous bad seasons. In Ajmere-Merwara there was a considerable increase in the number of

births registered, *viz.*, a birth-rate per mille of 36 against only 16 in the previous year and only 14 in year 1900. The death-rate was 32 per mille as against 33 in the previous year. The registration of vital statistics in these Native States is still unsatisfactory, and efforts are being made to improve this matter. Owing to lack of funds it has not been found possible to carry out the proposal of the A. M. O. in Rajputana for the improvement of the water-supply of the Ajmere City, which is now taken from the Foy Sagor Lake. Residency and Agency Surgeons, are endeavouring to teach and advise as to simple sanitary measures in the villages and Native States, where progress is naturally slow and slight. It is satisfactory to read of only three deaths from small-pox in Ajmere-Merwara, and in eleven Native States only 201, this may fairly be attributed to the good progress of vaccination, as we read of an increase of vaccination in Ajmere-Merwara and a very large increase in the Native States. Humanised lymph is chiefly used, but in some States buffalo calf lymph is now largely employed.

There were 165 hospitals in Rajputana, and nearly 2 million patients treated. The number of beds available is 1,461, for 909 males and 552 females; as regards the diseases treated we read of 401 cases of leprosy, 1,843 cases of scurvy. Plague also appeared. In the Banswara State the Durbar "was especially obstructive," but by the personal exertions of Major R. Shore, I.M.S., the Residency Surgeon, Mewar, the inhabitants (over 7,000) were persuaded to adopt precautionary measures, and practially the whole city went into camp. In the Mahomedan State of Tonk the personal exertions of Major R. C. MacWatt, I.M.S., successfully overcame the strong prejudices of the people. In Alwar State 199 cases of plague were discovered, and it is satisfactory to read that except in two villages most of the inhabitants of affected villages submitted to be inoculated.

We always expect good surgery from the hospitals in Rajputana, and so find it. In Ajmere-Merwara and the Native States over 61,000 operations were performed, of these 854 were for cataract, with 85·7 per cent of good sight results, there were also 68 lithotomies, 90 litholapaxies, and 153 amputations. The list giving the number of operations done by individual operators has been abolished. The Jail statistics are also given in this report. We note that the cost per head of average strength of prisoners is very low, only 47 rupees compared with 75 in Bengal. The death-rate in Ajmere Jail is not high, 29 per mille. Bikaneer, however, is only 5·9, Jodhpur 9·4 and Alwar 21·4 per mille, Jaipur for convicts 40. There was overcrowding in Ajmere, Jaipur, Jodhpur, Sirohi and Bharatpur, in some cases to a considerable degree. In many cases the death-rate for undertrial prisoners was higher than that for convicts, showing the poor health generally of prisoners on admission to prison. The rates vary to a considerable degree, *e.g.*, the small jail at Jhalrapatam had nine deaths or a rate of 74 per mille, Jaisalmer had six deaths, giving a rate of 82; Banswara is raised to a bad eminence by a death-rate of 327 per mille, with 34 deaths, out of a small average population of 124, but here we a find a daily average of 124 prisoners in a Jail with accommodation for only 68, so the high death-rate needs no further explanation.

Correspondence.

JAIL STOMATITIS.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

DEAR SIR,—I have read with much interest the article on "Jail Stomatitis" by Dr. Dutt, in the May issue.

The writer says that he has "vainly looked for it among dispensary cases."

In the event of its being of interest to the writer, and may be to others, I send you the following notes with regard to a disease most prevalent in this district, both in children and adults, and one which is often very obstinate in lending itself to treatment. I have seen it in all its varied forms. In children chiefly as small blisters, in adults commonly as a purple sponginess of the gums with loosening of the teeth. The "ulcerative" variety is not so common. The "mercurial" with firm, not soft, gums, is not rare.

Firstly:—The population is chiefly rural. The diet is almost entirely "Dal" and "Chapaties" and with few extras. We have therefore a diet which one may say contains little or no acids. Thus there is some excuse for those who maintain that the condition is due to scurvy, did we not investigate a bit further.

Secondly.—This district can hardly be said to be malarious and personally I do not see any connection between malaria and stomatitis, except in so far as a debilitated constitution is apt to be attacked with digestive trouble. For I agree with Dr. Dutt, that it is this latter which is the main factor, and also that it is connected with acidity.

Thirdly.—At which seasons of the year is it most prevalent? I am sorry I have no written records to go upon, but I think I am right in saying that early summer and autumn are the prevailing seasons. We note that it is at these two seasons that a sudden change in diet takes place, and that change is from a dry to a green vegetable diet. At the time of writing, melons and cucumbers are forming a most important item in diet. So much so, that they often take the place of ordinary food.

At the same time I notice that there is a rise in stomatitis cases. I see little children sucking cucumber, and their mothers complain that they have blisters inside the mouth.

May we not say that there is a sudden change from a salt to an acid diet? A change which, every one knows, will produce gastric trouble.

Autumn is the second season that this disease will be rife, not on account of malaria, but that it is then the sugarcane is ripening. And here we have a double action,—irritation and acid. This is the commonest time of the year for it, so far as the agricultural classes are concerned. To that there can be little doubt but that this sudden change to an acid diet is an important factor.

I feel that I should not close without mentioning one other possible cause.

I have seen the disease among ladies of high caste native families and have found it very difficult to treat. It has been in conjunction with gastric trouble. I have been told by them that "sugar" is a predisposing cause; and from observation, I am inclined to think that it is so; and one can quite easily understand how it may be.

I am, &c.,

H. MARTYN NEWTON.

PAY OF OFFICIATING CIVIL SURGEONS.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—With reference to the letter of "Deluded" in the June number of the Gazette.

Though Indian Army Regulations, Vol. I, Part I, Para 534. (and others) apparently lays it down distinctly that the Medical Officer in substantive charge of a Native Regiment is entitled to half the staff salary of his substantive appointment (on which he has a lien until three years of absence have elapsed) when acting in another appointment, yet the Accountant General, Bombay, also will not allow this half staff salary to an officer acting as a Civil Surgeon.

In the case of Bombay Presidency the rates of pay of a Civil Surgeon were laid down at fixed rates in the *Bombay Government Gazette* of the 18th April 1887, which was before the increased rates of pay for the I.M.S. were sanctioned, and when the pay then sanctioned by the above Resolution was equal to the Grade-pay plus half the staff salary of the regimental appointment.

This antiquated Resolution is made to overrule the Indian Army Regulations.

As an Acting Civil Surgeon is usually in substantive military employ and hence not entitled to Civil leave rules, Military rules regarding pay, *i.e.*, Indian Army Regulations, Vol. I, should logically apply to him.

The Acting Civil Surgeon, who is in substantive medical charge of a regiment, is therefore apparently not entitled to benefit by Military pay rules, or by Civil leave rules, that is to say, he loses the half staff salary of his permanent appointment, and yet if he goes on furlough he can only draw £200 or £250 per annum, and not £500, and moreover goes to the bottom of the list of men acting in the Civil Department.

In addition to this he has, on being appointed to the substantive charge of a regiment, to pay heavy Mess and band donations and increased subscriptions, and has not the advantage of drawing half the staff salary to compensate for this outlay.

Yours, &c.,

9th June 1904. PERPLEXED.

"SULFONAL IDIOSYNCRASY."

To the Editor of "THE INDIAN MEDICAL GAZETTE."

DEAR SIR,—In your March number, pages 96—97 and April number, page 159, appeared articles about "*Sulfonal Idiosyncrasy*." As we are interested in this product we drew our head office's attention to this and have received the following reply and explanation which will, no doubt, interest you and which you would oblige us by publishing in your next number:

"We beg to say that in the present case, we have to do with a very pronounced case of idiosyncrasy, which a good many persons show not only after having taken certain drugs

but also after the ingestion of certain foods, like strawberries, craw fish, etc., by getting affected then with nettle-rash, erythema, etc.

"Unfortunately, there is nothing to be done against these idiosyncrasies, even not by taking precautionary measures, which, for the rest, are well applied in administering Sulfonal and which we can but recommend to any medical man.

"In order to avoid the possibility of after-effects, it is absolutely necessary to give it in the form of a fine powder, with plenty of some hot liquid. When administered for a prolonged period, the daily use of 1 or 2 bottles of some *natural* alkaline water (Seltzer, Apollinaris, etc.) is advised.

"The bowels must be kept open, and should the patient, before the Sulfonal medication has been started, be affected with constipation, his doctor should have recourse at once to effervescent powders, or Carlsbad salts.

"Sulfonal has no disagreeable effect on the heart and, as a rule, exceedingly higher doses are administered and well tolerated than in the case in question.

"As to No. 3 of Dr. Newell's remarks, with regard to the instructions for use. Where he says that Sulfonal should be given nine hours before action is required, we suppose that this is but a slip of the pen, as one or two hours before retiring are quite sufficient.

"By the way, if Sulfones are chosen as hypnotics, Trional should always be preferred to Sulfonal, the former being more easily soluble and quicker in its action. Also symptoms of intoxication are less often met with."

Along with this report our Elberfeld friends have also sent us a reprint of an article in the German language. "What precautions do the Antipyretics teach us?" the contents of which might also be applied to the use of Sulfonal. We are having this article translated and hope to send you same in a few days. We trust you will then grant this article a publication also.

We are, Dear Sir,

BOMBAY, *July*, 1904. } Yours faithfully, FARBENFABRIKEN BAYER & Co., LD.

A DISCLAIMER.

To the Editor of "THE INDIAN MEDICAL GAZETTE.

SIR,—On receipt of your January number (1904) in London, I wrote in full replying to a letter in that issue entitled "The Puff Direct" for publication—but you did not acknowledge my communication in the column for that purpose and you did not publish my reply. I asked you a short time since if you had any record of the receipt of my communication, and your reply was that you had not. I shall be much obliged if you will publish this letter.

With regard to your correspondent "Advertiser" and "The Puff Direct," I beg to state that I had no connection either direct or indirect with the publication in the *Statesman* referred to by "Advertiser," and that I was unaware of even the existence of the *Statesman* until "Advertiser" unintentionally made me aware of it. On receipt of your January number I wrote to the *Statesman* asking them to avoid professional references to me in future.

Who "Advertiser" is does not concern me. The Editor accepts responsibility in full for anonymous letters published in his journal, and in this sense I have to complain of his action in publishing that letter without having taken the trouble to ascertain the veracity of the facts in so far as they concerned me and without having given me the opportunity of having my reply published in the same issue with "Advertiser's" letter.

Yours, &c.,
HENRY SMITH,
Major, I.M.S.

JULLUNDUR,
7th July 1904.

[We are glad to publish Major Smith's letter. We do not believe that anyone ever thought he had anything to do with the notice objected to in the newspaper. He was moreover in England at the time. We are very sorry that we were unable to publish this disclaimer sooner, owing to the letter never having reached us.—*Ed., I. M. G.*]

PLAGUE: A SOIL DISEASE.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—May I be allowed to point out that owing to a misprint in your July issue in my paper "Plague, a soil infection" (the word *typical* being printed instead of *atypical*), the meaning of what I intended to convey is confused. I ventured to divide the stages of a plague epidemic thus:—

(1) Period of quiescence.
(2) Stage of sporadic *atypical* cases.
(3) Stage of local place infection.
(4) Early epidemic stage.
(5) Fastigial stage of the epidemic.
(6) Stage of decline.
(7) Period of local immunity, and period of quiescence.

The point which I wished to emphasise was the absolute necessity of recognising the existence of the sporadic atypical cases which so often precede the appearance of the common bubonic variety, and the non-detection of which, in my opinion, very often determines the rise of an epidemic. The most important of these cases to recognise are instances of sudden death in young and otherwise healthy women, following miscarriage. The miscarriage is always attended with profuse hæmorrhage, and the death therefore is almost always put down to *post-partum* hæmorrhage. When three or four of these deaths occur within a few days of one another in some division of a town or city, it may be held with certainty that plague is present therein.

Yours faithfully,

MHOW. E. F. GORDON-TUCKER,
Capt., I. M. S.

Service Notes.

THE following account of the beginning of the Army Medical Department of the United States is of interest—(*Journal A. M. Assoc.*):—

The Medical Department of the United States Army had its beginning on the 27th of July, 1775, when the Colonial Congress at Philadelphia voted a medical establishment, or, as it was then called, "an hospital," for the Army. Prior to this enactment the surgeons of the forces before Boston had been appointed by the colonels of regiments, with the wise proviso, however, on the part of the Provincial Congress of Massachusetts that they should be examined by a medical board named by the Provincial Congress. Of course, among these surgeons there could be no cohesion or effective co-operation, and, as General Washington wrote to the congress at Philadelphia, affairs were in a very unsettled condition. "There is no principal director nor any subordination among the surgeons; of consequence, disputes and contentions have arisen, and must continue until it is reduced to some system."

The first department consisted of the director-general and chief physician, four surgeons, twenty surgeons' mates, an apothecary, a clerk, two storekeepers and a nurse to every ten sick. It may be of interest to mention that the pay of these officers was as follows: The director-general, $120; the surgeons, $40; the surgeons' mates, $20; the storekeepers, $4, and the nurses, $2 a month.

Dr. Benjamin Church of Boston was elected director-general, and he was given the appointment of all the personnel of the hospital, except the surgeons' mates, who were appointed by the surgeons. Dr. Church had a reputation for culture and professional skill, but was a few months after his appointment detected in treasonable correspondence with the enemy, deposed and thrown into prison. He was succeeded by Dr. John Morgan of Philadelphia, a man of much energy and administrative ability as well as professional skill. He soon gained the friendship and support of General Washington, and these he always retained.

With the extension of the theatre of war, the number of surgeons was increased, and Drs. Skinner and Shippen were named chief surgeons for the northern department and the forces on the west bank of the Hudson. The organization was, however, too loose to secure efficiency or concert of action. The relations of the regimental surgeons to each other and to those in charge of the general hospitals were entirely undetermined, and the department surgeons refused to admit the authority over them of Dr. Morgan. There was beside no well arranged system of medical supply, and in consequence there was much suffering, and complaints multiplied. As has happened since more than once, Dr. Morgan was punished for the very shortcomings for which he had in vain asked Congress to provide a remedy, and he was dismissed in January 1777. Congress the next year exonerated him from all blame, but did not reinstate him.

A complete and elaborate organization of the medical department, modelled on that of the British army, was adopted in April, 1777, and Dr. William Shippen was elected director-general of the new establishment. Deputy director-generals were provided for the northern and southern departments, and under these a physician-general and surgeon-general in each district, "whose business it shall be to superintend the practice of physic and surgery in all the hospitals of the district." This separation of the practice of physic and the practice of surgery which obtained in Europe at that time, and in England, has in civil life, lasted until the present day, necessitated a most cumbrous and awkward dual organization, which soon disappeared under the rudely practical test

of war. It is probable that most American physicians at that time outside the larger cities practised surgery to some extent, in addition to the practice of physic. The regimental surgeons seem from the first to have combined the two arts, and we find in the bill, which, in 1780, reorganized and simplified the medical establishment, an explicit provision that "there shall be three chief hospital physicians who shall also be surgeons, one chief physician who shall also be a surgeon, one chief physician who shall also be surgeon to each separate army, fifteen hospital physicians who shall also be surgeons," etc. But although the medical officers of the Army thereafter appeared to have been both physicians and surgeons, the former title seemed tohave been rather reserved for the higher grades, while the title "surgeon" became by the end of the Revolutionary War generic for all medical officers.

At the end of the Revolution the Army was disbanded, except fifty-five men at Fort Pitt and twenty-five at West Point to guard the military stores at these places. The officer highest in command was a captain, and the medical department was reduced to the vanishing point. The Revolution had produced a number of distinguished military surgeons, among whom were Cochran, John Warren, Craik and Tilton, in addition to those already named. The pressure of Indians on the western frontier after a few years prevailed over the morbid fear of a regular army with which our ancestors of a century ago were possessed, and in 1789 a regiment of regular infantry and a battalion of artillery were organized, with a medical service of one surgeon and four surgeons' mates.

The War of 1812 brought an army again in the field, but as the medical department was without a head and the surgeons had not even assimilated rank, good medical administration was impossible. In March, 1813, Congress created the positions of physician and surgeon-general and apothecary-general, the latter to act as assistant to the former, and as medical purveyor. The surgeons were divided into hospital and regimental surgeons, of whi h the former were superior in rank and pay. Both had mates or assistants, and there were in addition post surgeons who ranked with the mates.

The title of surgeon-general appears first in the Act of May 14, 1818. Joseph Lowell was appointed to this position, and in that year he made the first annual report of the surgeon-general to the Secretary of War, and also drew up a set of regulations for the medical department. He remained for eighteen years at its head, and during that time by his ability and force of character, shaped and organized the corps of army surgeons into a coherent and efficient medical staff. He was succeeded by Thomas Lawson, a man of strong character and fine professional and administrative abilities, and withal a brave and ardent soldier, and a most original character. He entered the Navy in 1809 as surgeon's mate, but left that service for the Army in 1811. His service as a medical officer of the Army covered the remarkable period of fifty years and three months, and included active and distinguished service in the War of 1812, the Indian Wars and the Mexican War. When he became surgeon-general, in 1836, medical officers were without military rank, and in addition to the great disadvantages of such a status, suffered frequently from the insolence and contempt with which the line officers of that day, following the traditions of the British service, were inclined to regard the medical profession. Surgeons, for example, were not entitled to a salute from enlisted men, and when serving on boards were ranked by the youngest subaltern in the service. In the new uniform, adopted in 1839, they were allowed a sword, but not the officer's epaulettes, an aiguilette being prescribed instead; "a piece of tinsel on one shoulder," as Lawson contemptuously described it.

To establish and maintain the dignity of his profession and his corps, was to Thomas Lawson a sacred mission, to which he devoted himself with such courage, pertinacity and keenness of wit that he achieved success in all the important claims advanced in behalf of his corps, culminating in the Act of February 11, 1847, which conferred on medical officers the assured and honorable status of definite military rank. It is a tradition in the service that on the passage of this Act the grim old fighter sent around to medical officers a confidential circular to the effect that now that they had the status of officers they must promptly challenge any other officer who failed to show them proper respect.

The medical service of the Mexican War seems to have been performed with the same efficiency, courage and devotion to duty which marked all the operations of the small but glorious armies under Scott and Taylor, and such men as Satterlee, Tripler, Simpson, Cuyler, Wright, Moore and Barnes laid in it the foundation of reputions which were destined to grow under the far wider responsibilities of the Civil War. In the fierce assault of Molino del Ray, Assistant Surgeon William Roberts was killed and Assistant Surgeon James Simons was wounded.

The thirteen years which intervened between the Mexican War and the outbreak of the Civil War were years of activity and progress for the medical corps, although the Utah Expedition against the Mormons in 1858 was the only military event of note. An important advance in the standard of the examination for admission was made in 1849, when a knowledge of Latin, of physics, of practical anatomy in the form of dissection, and clinical experience acquired either in a hospital or in private practice were made prerequisites. In 1850 the Medical Department of the Army was first formally represented at the annual meeting of the American Medical Association.

The Civil War was the first in which large armies made their appearance on American soil, and in these great army corps of volunteers many of the glorious traditions and hide-bound prejudices of the old Army disappeared along with its regiments and batteries. Yet it was none the less the leaven hid in three measures of meal, which leavened the whole lump, and this is true not less of the Medical Department than of the line.

On January 1, 1861, the Army numbered 16,460 and the Medical officers 115, or .7 per cent. of the whole—a considerably greater proportion, by the way, than exists to-day. Although by far the largest of the staff corps, it had the smallest proportion in the higher grades, and this also is still the case, with the single exception of the Signal Corps the junior of all, whose handicap is perhaps a matter of inheritance, as its originator, Myer, was a medical officer.

The medical history of the Civil War marks an epoch in military sanitary organization even greater than was made in the art of war by Sheridan's use of cavalry or the nasty entrenchments of Lee. It is a glorious chapter of American history, but the full story of the ability and devotion of the surgeons of the Civil War, regular and volunteer, must be sought, not in the limits of an article, but by those who have industry and good eyesight, in the ponderous volumes of microscopic print which make up the "Medical and Surgical History of the Rebellion."

The idea of medical organizations in the field, drilled and trained to gather up the wounded from the battlefield, transport and care for them, developed by Larrey and Percy in the Napoleonic wars, had perished with the armies of the First Empire under the retroactive prejudices of the old monarchies, and the military taboo of even republican America forbade a physician to exercise the sacred function of "command" over trained enlisted assistants of his own department or even to have a permanent and unquestioned jurisdiction over the mules and drivers of the medical ambulances. He controlled in battle his own two hands, and these only, unless the colonel saw fit to give him the uncertain and doubtful assistance of the regimental band. The following letter taken from the files of the Surgeon-General's Office permits a glimpse of the tragedy behind the scenes:

SURGEON-GENERAL'S OFFICE, SEPT. 7, 1862.

HONORABLE EDWIN M. STANTON, Secretary of War.

SIR—I have the honor to ask your attention to the frightful state of disorder existing in the arrangement for removing the wounded from the field of battle. The scarcity of *ambulances*, the want of organization, the drunkenness and incompetency of the drivers, the total absence of ambulance attendants are now working their legitimate results, results which I feel I have no right to keep from the knowledge of the department. The whole system should be under the charge of the Medical Department. An ambulance corps should be organized and set in instant operation. I have already laid before you a plan for such an organization, which I think covers the whole ground, but which I am sorry to find does not meet with the approval of the general-in-chief. I am not wedded to it. I only ask that *some* system may be adopted by which the removal of the sick from the field of battle may be speedily accomplished and the suffering to which they are now subjected be in future as far as possible avoided.

Up to this date six hundred wounded still remain on the battlefield in consequence of an insufficiency of ambulances and the want of a proper system for regulating their removal in the Army of Virginia. Many have died of starvation, many more will die in consequence of exhaustion, and all have endured torments which might have been avoided.

I ask, Sir, that you will give me your aid in this matter, that you will interpose to prevent a recurrence of such consequences as have followed the recent battle, consequences which will inevitably ensue on the next important engagement if nothing is done to obviate them.

I am,
SIR,
Very respectfully,
Your obedient servant,
WILLIAM A. HAMMOND, Surgeon-General.

Yet even this picture of the 600 men who had lain ten days on the battlefield of Second Bull Run could not bring the commanding general to lift the taboo and approve of enlisting men for the Medical Department. But while the Surgeon-General was vainly struggling with the prejudices of General Halleck, light had broken in another quarter. July, 1, 1862, Surgeon Jonathan Letterman reported to General McClellan

to be medical director of the Army of the Potomac. He was only 38 years old, having entered the service in 1849, and had just received his promotion to major. The Army of the Potomac was at this time crowded with sick and with the wounded of seven days' fight, and in the retreat to Harrison's Landing most of the medical equipment and supplies had been lost or expended. In the course of a month he brought order out of this chaos, and at the same time drew up a plan for an ambulance corps—simple, far-reaching and effective—which General McClellan was quick to adopt. The personnel for this corps was obtained by transfers of officers and men from the line, and they, as well as the ambulances and other transportation, were placed entirely in the hands of the medical directors of the several army corps. A distinctive uniform and a simple drill were prescribed. This organization was announced in orders apparently without reference to Washington on August 2, and was soon followed by a scheme for regimental medical service and the establishment of division field hospitals in October. These taken together made a complete workable system, which at once made a new epoch in medical organization, and placed the Army of the Potomac far ahead of any military establishment in the world in this respect.

Meanwhile the system had its first trial at Antietam, September 7, where the wounded of the Army Corps from the Army of the Potomac were promptly removed from the field and cared for, being in marked contrast with the experience of the wounded of the other wing made up of troops from Pope's army. In the bloody battle of Fredericksburg, where, in addition to the great number of wounded, was added the confusion of a defeat, the ambulance companies nevertheless did their work with smoothness and dispatch, and the wounded were transported without confusion or delay to the division field hospitals. As reported by Surgeon Charles O'Leary, Medical Director of the Sixth Corps, it "afforded the most pleasing contrast to what we had hitherto seen during the war."

This medical organization soon spread to the other armies of the United States, and was formally adopted by Congress in the spring of 1864. It was not copied from European models, but, on the contrary, has been, in its essential features, adopted by all civilized nations, and it is probable that the name and fame of Jonathan Letterman are better known to-day to the military surgeons of Europe than his own country. Nor during his lifetime did this great and beneficent genius receive any promotion or any reward other than the commendation of his general and the admiration of his professional comrades. This splendid constructive work was done, and the vast responsibilities of chief medical officer of a great army were met and surmounted by a man who was given only the rank and pay of a major. When the Surgeon-General proposed that the medical directors of the armies under McClellan and Halleck be given the temporary rank of colonel, which was enjoyed by other staff officers, the War Department returned the ungracious and fatuous reply: "Refused, unless it can be shown that the skill and effciency of surgeons are increased by an increase of rank and pay." This rank was afterwards given to the medical directors of armies in the field by the Act of February 23, 1865. It is not surprising that Letterman, broken in health by his great labours and disgusted at the blind ingratitude of those in authority, resigned from the service in December, 1864, and died in San Francisco some years later.

The Medical Department during the Civil War disbursed over $47,000,000, and cared for 1,057,423 sick in its general hospitals alone, without counting those that passed through the field and regimental hospitals. Of the medical staff, 115 were shot in battle, of whom 42 died, and 285 died of disease. This great struggle has left behind it, as monuments of the labours of the medical profession, the Army Medical Museum and the great national institution known as the library of the Surgeon-General's Office. The record of their professional work is given in the "Medical and Surgical History of the Rebellion," which, in spite of the advances in professional knowledge since that time, remains an inexhaustible mine of statistical information, while the reports of medical directors in the appendix are of permanent value and interest to all who are interested in the great and ever-recurrent problems of medico-military administration.

REWARDS—GOOD CONDUCT AND MERITORIOUS SERVICE.—The undermentioned are awarded silver medals for long service and good conduct:—

(Without gratuity.)

1st class Assistant-Surgeon		Edwin **Weston.**
Ditto	ditto	Vincent Edward **Fernandez.**
Ditto	ditto	Hugh Alfred **Lafond.**
Ditto	ditto	Lewis Arthur Henry **Clerke.**
Ditto	ditto	(now Senior Assistant Surgeon) Francis Alexander **Wynne.**
Ditto	ditto	Harry **Day.**
Ditto	ditto	Francis James **Daley.**
Ditto	ditto	Daniel Robert **Davies.**

THE following hospitals are employed with the Tibet Mission Force, Native General Hospitals 1, 2 and probably 3. British Field D. /21; A./22; Native Field C. /57; D./57; A. B. C. D. /71; B. C. D. /76. The medical officers employed are at time of writing—Lieutenant-Colonel L. A. Waddell, I.M.S., C.I.E., Principal Medical Officer; Major Aldridge, R.A.M.C., Sanitary Officer, Captain Kelly, I.M.S., Staff Surgeon; Captain Mainprise, R.A.M.C.; in charge of D. /21 F. H.; Capt. Stevenson, R.A.M.C., in charge, A. /22 F. H.; Captain Connolly in medical charge, 7th Fusiliers; Major Wimberley, I.M.S., A. /71 F. H.; Captain Davidson, C. /76 F. H.; Captain Baird, I.M.S., 23rd Pioneers; Captain R. Steen, I.M.S., D. /57 F. H.; Captain Leonard, I.M.S., C. /71 F. H.; Captain Cook-Young, I.M.S., B. /71; Lieutenant H. W. Illius, I.M.S., 32nd Pioneers; Lieutenant R. E. Lloyed, I.M.S., D. /71 F. H.; Lieutenant Franklin, I.M.S., 8th Gurkhas; Lieutenant Davys, I. M. S., Supernumerary; Lieutenant Murray, I.M.S., Convoy Duty; Lieutenant O'Leary, I.M.S., B. /76 F. H.; Lieutenant Dutton, I.M S., D. /76 F. H.; Lieutenant Saigal, I.M.S., C. /56 F. H.; Lieutenant Lee-Abbott, I.M.S.: 40th Pathans.; and Lieutenant Dunn; I.M.S., 40th Pathans.

CAPTAIN N. S. WELLS, I.M.S., Deputy Sanitary Commissioner, Western Bengal Circle, was granted privilege leave from 27th April to 23rd May, and Assistant-Surgeon Gopal Chundra Mukherjea, in charge of the anticholera inoculation at Purulia, acted for him in addition to his other duties.

LIEUTENANT-COLONEL A. J. STURMER, I.M.S., Superintendent of the Government Maternity Hospital, Madras, and Professor of Midwifery at the Medical College, was granted privilege leave for two months and two days ending 4th July 1904.

LIEUTENANT-COLONEL J. MAITLAND, M.D., I.M.S., was granted privilege leave for one month ending 17th June.

THE leave of Lieutenant-Colonel J. Lancaster, I.M.S., expired on 4th July 1904.

THE leave of Lieutenant-Colonel H. Thomson, I.M.S., Madras, will expire on 2nd March 1905.

THE leave of Major R. Robertson, I.M.S., will expire on 6th November 1904.

CAPTAIN H. KIRKPATRICK, I.M.S., Professor of Pathology, Madras Medical College, will return from leave on 19th August 1904.

CAPTAIN A. CHALMERS, I.M.S. (Madras), is due to return from leave on 13th November 1904.

CAPTAIN J. J. ROBB, I.M.S., who reported at Madras on 2nd May 1904, is appointed Acting District Medical and Sanitary Officer, Coimbatore.

LIEUTENANT S. BOSE, I.M.S., who reported at Madras on 4th May, is appointed acting District Medical and Sanitary Officer, Cuddapah.

LIEUTENANT S. R. CHRISTOPHERS, I.M.S., who is on special duty in connection with malaria, under the orders of the Director-General, was also appointed Superintendent of the King Institute of Preventive Medicine, Guindy, Madras, until further orders.

FOR the 48 sanctioned cadre appointments in the Madras Civil Medical Department, 59 names of officers are borne on the rolls; of these 14 were absent on 1st June 1904, on leave or otherwise, and the number actually present was forty-five.

THE services of Captain H. D. Peile, I.M.S., are permanently placed at the disposal of the Chief Commissioner, C. P., for employment in the Jail Department.

MAJOR P. J. LUMSDEN, I.M.S., Agency Surgeon, Kotah and Jhallawar, was granted six weeks' privilege leave from 10th June 1904.

LIEUTENANT H. E. SMITH, I.M.S., is appointed to have medical charge of the civil station of Buxa, Duars, in addition to his regimental duties from 8th May 1904.

Good Conduct and Meritorious Service.—It is notified for information, in supersession of all previous orders on the subject, that the Right Hon'ble the Secretary of State for India has sanctioned the provisions of Army Order No. 155 of the 1st July 1902, under which warrant officers of the British service are eligible for the grant of the medal for long service and good conduct, without gratuity, being extended, with effect from the 14th March 1904, to all classes of warrant officers in India, however employed.

2. The Government of India have accordingly been pleased to declare that warrant officers of all Indian departments (including assistant surgeons of the Indian Subordinate Medical Department), and non-departmental warrant officers of the Indian Unattached List, serving on or after the 1st June 1902, are eligible for the medal, without gratuity. The reward is also admissible to all classes of non-commissioned officers and men serving in civil departments.

3. All applicants must have served for 18 years with an irreproachable character and their applications should be supported by certified copies of their defaulter sheets (up to the date of promotion to warrant rank in the case of warrant officers), departmental character sheets, the recommendation of the officer under whom they are serving and of the head of the department.

4. The claims to this distinction of warrant officers and others serving in a civil department will be considered with reference to their defaulter sheets, up to the date of their joining the department, and certificates will be furnished by their departmental superiors that their conduct and character during the period of their service in the department have been in every respect exemplary.

Captain H. J. K. Bamfield, I.M.S., made over charge of the civil medical duties of Bannu to Lieutenant F. T. Thompson, I.M.S., on 19th May 1904.

The following pleasant account of the treatment of our Tibetan foes in our field hospitals is furnished by a correspondent:—

"Of the 168 wounded sent in to the Tibetan hospital at Tuna after the Hot Springs Red Idol Gorge engagement, 148 have been discharged cured, and 20 died. The hospital has now ceased to exist. The Tibetans showed extraordinary stamina and stoicism, and were consistently cheerful. One, who had lost both legs, remarked: "In my next battle I must be a hero, for I cannot run away." Some of the wounded were terribly mutilated by shell. Two who were shot through the brain and two through the lungs, survived the operation. One man had seven bullets, causing nineteen wounds. Many of the wounded rode in 50 to 60 miles on yaks. For ten days Lieutenant Davys, who was in sole charge, was operating nearly all day. It is the first time any surgery on modern lines has been done in Tibet. The hospital was an abandoned Tibetan dwelling-house, and the operating theatre the empty cowsheds outside. The Tibetans were evidently impressed by our humanity and seemed to regard Lieutenant Davys, I.M.S., as some incarnation of the medicine Buddha. Every care was shown to the wounded, who were sent to their homes on hired yaks."

The following is the comment of the *British Medical Journal* on the "Extraordinary order" as it calls it:—"The absurdly low fee allowed to be paid by a native chief with a huge income, of £3 6*s.* 8*d.* for a single visit, however many hundred miles the doctor may have travelled, except by special sanction of the Local Government (which means an officer of the Indian Civil Service, the notorious jealousy of which is well known to be the cause of these absurd rules) is sufficient to reveal the spirit in which the rules have been framed. There is, however, nothing new about this part of the ruling, which was recently characterized by the Naval and Military Committee of the British Medical Association as 'an insult to the medical profession.' A case recently occurred in which it is said that a medical officer performed a successful operation for cataract on a native chief, but the very moderate fee offered by the patient was materially reduced by the civilian officer to whom it had to be reported for sanction. On the patient requesting the surgeon to operate on the other eye he declined on the ground that the Local Government would not allow him to take a fee which would compensate him for the loss of time in going to the Native State in question and remaining for several days to ensure the success of the operation. He was then ordered by the Local Government to go and do the second operation for the fee fixed by them. Such a condition of affairs is intolerable, and reveals the petty spirit in which the rules are carried out in practice.

In the new rules, however, a more serious question than the mere monetary one crops up, for under these new rules the medical officer is compelled to report the details of his patient's illness and of his treatment to a civilian non-medical man; the latter will then assess the amount of the fee to be received, for it will be observed that it is stated that the reference to the administrative officer is not obligatory, but will only occur when the civilian officer considers it to be necessary to do so, and in any case the final orders are issued by the civilian officers. In the first place, this order raises the very important question as to whether a medical officer is justified in revealing professional secrets as to his patients to any one, even under the orders of the Government. The inquisitorial nature of the whole proceedings is also most objectionable, and these orders may very well result in a self-respecting medical man refusing to attend any native chief except one of whom he may be in medical charge as part of his routine duties. Whether a medical officer would be justified in refussing to furnish any information as to the condition of his patient or the fee received by him on the grounds that he cannot reveal professional secrets is a delicate one, but such a course of action, whether right or wrong, would only lead to his being severely punished by the Government by being removed from his appointment, and sent to some undesirable station."

Royal Army Medical Corps—Examinations. At the examinations of Majors for promotion to Lieutenant-Colonels held in India in March 1904, the undermentioned officers passed in the subjects prescribed in Appendix VIII-B, King's Regulations, headings (2) to (5):—

Major	R. S. F. Henderson	(Bombay.)
,,	A. T. I. Lilly	(Bombay.)
,,	W. E. Berryman	(Bengal.)
,,	F. W. C. Jones	(Bombay.)
,,	M. J. Sexton	(Bengal.)
,,	F. W. G. Hall	(Punjab.)
,,	J. B. Buchanan	(Bengal.)
,,	B. H. Scott	(Punjab.)
,,	J. Thomson	(Madras.)

The following officers have passed the Higher Standard in Pushtu:—

Lieutenant O. St. J. Moses, I.M.S., Asst.-Surgeon Stevenage; Captain A. G. Sargent, I.M.S.

Captain A. E. Milner, R.A.M.C., is appointed Staff Officer, A. B. C. (Madras), *vice* Lieutenant-Colonel Lloyd, V.C., R.A.M.C., on leave.

Captain W. M. Anderson, I.M.S., has passed the Urdu Higher Standard.

Lieutenant W. C. Ross, I.M.S., has passed the Lower Standard, Urdu.

Captain J. H. McDonald, M.B., I.M.S., acted as Professor of Materia Medica, Grant Medical College, Bombay, as a temporary measure.

Lieutenant F. A. Fleming-Barnardo, I.M.S., whose article on Scurvy in Somaliland we published in our July issue, has passed the examination in the Somali language. He was acting as Staff Surgeon to Head-quarters in Somaliland.

Lieutenant-Colonel A. V. Anderson, I.M.S. (Bo.), is granted twelve months' combined leave.

Lieutenant-Colonel R. S. Nariman, I.M.S., was granted an extension of privilege leave for 15 days.

Captain Thomas Jackson, M.B., is granted three months' privilege leave.

Honorary Lieutenant G. T. Milchem, I.S.M.D., is appointed Civil Surgeon of Garhwal.

Medal Ribbon.—The medal ribbons noted below are available for sale on payment indent at the Army Clothing Factory, Alipore, at an inclusive charge of eight annas per yard:—

Ribbon, silk, medal—

Abyssinia	35 yards.
Afghanistan, 1842	5 ,,
Afghan, 1878—80	700 ,,
Central Africa, 1891—94	8 ,,
Soudan, Khedive's	75 ,,
Egyptian, 1882—84	500 ,,
Kabul—Kandahar, bronze star, 1880	50 ,,
Egypt, bronze star, 1882	300 ,,
New Zealand, 1845—65	10 ,,
South Africa, 1877—79	100 ,,

WAR SERVICE, BURMA.—With reference to G. O. C. C. No. 235 of 1903, it is notified that the war service of all officers and others who actually took part in the Chin Hills and Kachin Hills Expeditions, 1892-93, will be recorded in the Army List as follows :—

"North-East Frontier of India—Chin (*or Kachin*) Hills, 1892-93. Despatches, etc."

ASSISTANT-SURGEON RAJANI KANTA DUTTA has passed the examination in the Assamese language.

THE services of Captain W. Glen Liston, I.M.S., were placed temporarily at the disposal of the Government of Bombay in the *Gazette of India*, dated 8th June 1904.

LIEUTENANT-COLONEL G. S. GRIFFITHS, I.M.S., was permitted to retire from the service from 1st June 1904, at the age of 50. He entered the service on 30th September 1876 in the same batch as Lieutenant-Colonels Moorhead, Owen, and and C. H. Beatson.

HONORARY CAPTAIN W. R. MCARDLE, Senior Assistant-Surgeon, I.S.M.D., was permitted to retire from 31st May 1904.

LIEUTENANT-COLONEL J. C. FULLERTON, I.M.S., A. M. O. in Baluchistan, was permitted to retire from the service from 25th June 1904. He entered the service in March 1874.

AT a Court-martial held at Roorkee recently a 3rd Class Civil Hospital Assistant was degraded forty steps lower "in the list of his rank for being in the possession of notes calculated to give him unfair assistance" in passing an examination for promotion.

CAPTAINS B. G. SETON, R. H. Elliot, R. K. Mitter and W. E. A. Armstrong, are promoted Majors, I.M.S., from 30th January 1904.

LIEUTENANTS W. F. MELVILLE, R. McCarrison, J. Masson, N. S. Wells, W. M. Anderson, E. H. B. Stanley, W. H. Leonard, A. W. Cook-Young, J. G. G. Swan, R. Mc L. Dalziel, J. J. Robb, S. A. Rozzak, and R. B. B. Foster are promoted Captains, I.M.S., from 29th January 1904.

THE King has approved of the retirement of the following officers:—Colonel C. W. Carr-Calthrop, I.M.S., from 2nd April 1904 ; and Lieutenant-Colonel T. H. Pope, I.M.S., from 1st March 1904.

THE following Officers, I.S.M.D., are promoted Senior Assistant Surgeons and Honorary Lieutenants—J. G. Fleming, P. Toomey, G. Gill, J. Gibb, A. H. Nolan ; and L. J. O'Reilly and H. Day are given the rank of Honorary Captain, I.S.M.D.

LIEUTENANT-COLONEL W. B. BANNERMAN, I.M.S., is appointed Officiating Director-in-Chief of the Plague Research Laboratory, Parel.

Captain W. GLEN LISTON, M.D., I.M.S., is appointed to the Plague Research Laboratory, Parel.

LIEUTENANT-COLONEL W. A. CORKERY, I.M.S., is appointed Civil Surgeon, Ratnagiri, but will continue to act, till further orders, at Ahmednagar.

DURING the absence of Major A. W. Dawson, I.M.S., Captain M. W. Falkner, R.A.M.C., holds medical charge of Roorkee.

CAPTAIN J. J. URWIN, I.M.S., was appointed Civil Surgeon of Tipperah during the absence on leave of Captain V. E. H. Lindesay, I.M.S.

MAJOR A. R. P. RUSSEL, I.M.S., delivered over charge of Myingyan District to Hospital Assistant Surgeon, Bastian, on 19th May.

MAJOR T. W. STEWART, I.M.S., is appointed Civil Surgeon of Myingyan.

MAJOR A. R. P. RUSSEL, I.M.S., is appointed Civil Surgeon of Mandalay.

WE are glad to learn that the I. M. S. dinner at Simla which takes the form of a farewell to Sir Benjamin Franklin, K.C.I.E., I.M.S., is likely to be a great success. We hope that there will be a similar dinner in Calcutta in March next before Sir Benjamin finally leaves India.

THERAPEUTIC NOTES AND PREPARATIONS.

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will **receive 25 Reprints gratis**, if requested.

Communications on Editorial Matters, **Articles, Letters and Books for Review** should be addressed to THE EDITOR. *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscriptions to the Indian Medical Gazette, Rs. 12, including postage, in India. Rs. 14, including postage abroad.

BOOKS, REPORTS, &c., RECEIVED.

Prevention of Disease of Armies in the Field. By Major A. Caldwell, R.A.M.C. (Baillière, Tindall & Cox.)
Our National Parks. By N. Senn.
Nothnagel's Encyclopædia. Tuberculosis. (Saunders & Co.)
Calders' Midwifery for Midwifes. (Baillière, Tindall & Cox.)
Assam Dispensary Report
Calcutta Medical Institutions Report.
Vaccination Report, Bengal.
U. P. Sanitary Report.
Bengal Sanitary Report.
Scientific Memoirs No. 10, Lamb's Antivenomous Sera.
Report of Maternity Hospital, Madras.
The Meaning of a Modern Hospital. By Dr. Bruce Clarke. (Longmans & Co.)
Cleft Palate and Hose Lip. By Owen. (Baillière, Tindall & Cox.)

ACKNOWLEDGMENTS, COMMUNICATIONS RECEIVED.

Major R. Caldwell, R.A.M.C., Meerut ; Lt.-Col. Waddell, I.M.S., C.I.E., Tibet ; Revd. G. G. Crozier, M.D., Assam ; Major Wood, I.M.S., Sylhet ; Major Moir, I.M.S., Calcutta ; Major H. Smith, I.M.S., Jullundar ; Major W. E. Jennings, I.M.S., Bombay ; Capt. Clayton Lane, I.M.S., Calcutta ; Sir Lauder Brunton, F.R.S., London ; Capt. Standage, I.M.S., Madras ; Lt.-Col. King, C.I.E., Madras ; Major Maynard, I.M.S., Darjeeling.

Original Articles.

PIROPLASMOSIS.

A HISTORY OF THE DISCOVERY OF THE DONOVAN BODIES IN MADRAS.*

BY C. DONOVAN,
MAJOR, I.M.S.,
Second Physician, Government General Hospital, Madras.

Piroplasmosis.—Under this head I have classified a new disease prevalent in Madras, the symptoms are those of so-called chronic malaria. As this new addition to the Indian fevers merits a full account, I shall write in some detail on its discovery, history, ætiology and symptoms; bringing the information up to date of writing this report (22nd February 1904). I had noticed many cases of chronic irregular pyrexia, with enlargement of the spleen and occasionally of the liver, bronchitis, œdema of the feet, subcutaneous hæmorrhages chiefly of the petechial type, diarrhœa of a dysenteric nature and cancrum oris. The treatment was most unsatisfactory, no drug having the least beneficial effect. Such cases were being registered in hospital as chronic malaria, but as I was not a believer in the pyrexia of malaria unaccompanied by parasites in the peripheral blood, I, for the nonce, classified the cases as enlargement of spleen, cause unknown. Notwithstanding I had still a lurking suspicion that there might be, some at present undiscovered stage of the malarial hæmatozoon, which might be the cause of these irregular pyrexias, that there were resistant forms of the genera Plasmodium and Laverania.

With a view to remove this doubt, I attended the *post-mortems* and took smears of blood from the spleens of cases said to have died of chronic malaria. On the first day, 9th April 1903, I found in a slide containing such a smear numerous peculiar round and oval ring-like little bodies, with two masses of chromatin situated on opposite poles; convinced as I was of their parasitic nature I could not, however, refer them to any group of the Protozoa. I thought I had discovered the long-sought-for-resting-stage-form of the malarial parasite in man. But on procuring the same bodies in two other cases on the 23rd and 24th April 1903, I changed my view and considered that they might be *post-mortem* degenerations of the nuclei of the splenic pulp cells. On the 15th June 1903, I received the *British Medical Journal* of the 30th May of the same year, and in it, on page 125, was an account by Major Leishman, R.A.M.C., of organisms identical with mine. I at once recognized the similarity of what Leishman called degenerations of the trypanosomata to the bodies found by me in the spleen blood of the three cadavers abovementioned.

About this time there was in my wards a native boy, Doraisami Mudali by name, aged twelve years, suffering from irregular pyrexia of two months' duration, enlarged spleen half-way down to the umbilicus, no malarial parasites in his peripheral circulation, after very careful examinations of stained (Romanowsky) specimens, although there was a well-marked increase of mononuclear leucocytes. To discover the cause of the enlargement of this viscus and of the irregular temperature, I punctured the spleen of this boy on the 17th June 1903, and found the bodies in the blood identical with those found *post-mortem*. The forms were larger, more varied and more clearly defined. On the 18th June I sent an account of my discovery to the *British Medical Journal* which appeared in that paper on the 11th July 1903, page 79. Incited by Leishman's statement that these bodies were degenerations of trypanosomata, I carefully searched for this class (Mastigophora) of the Protozoa but without success, nor up to date has anything bearing the least semblance to these organisms been found. I was at the time well acquainted with the appearance of trypanosomes, especially with the species, Evansi, Lewisi and one commonly existing in the blood of the Indian squirrel (Sciurus palmarum), so knew what to look for. On the 16th June 1903, I sent Ross three slides of these bodies (called for the time "Resistant bodies," as they resisted the action of quinine, and indeed of all other drugs) together with two temperature charts of cases Nos. 1 and 2 and a water-colour painting. On the 28th September 1903, I received their acknowledgment, dated 9th idem, and was informed that the slides would be carefully looked into next week. I sent Mons. Mesnil of the Pasteur Institute, Paris, on the 23rd September 1903, a slide containing these bodies and asked for the favour of his obtaining Laveran's opinion as to their nature; to this I had a reply, dated 15th October 1903, and received by me on the 1st November 1903, to the effect that he had examined the slides and had procured Laveran's decision which was:—"L'avis de M. Laveran est de plus nets: il s'agit d'un protozoaire nouveau, du genre Piroplasma. Puisque la ponction de la rate est faite intra vitam, il ne saurait s'agir de formes d'involution de Trypanosomes. M. Laveran écarte également l'idée de formes appartenant au genre Plasmodium, c'est-á-dire à l'hematozoaire du Paludisme." I received Ross's opinion on the 9th November, his letter is dated 21st October 1903, in which he says "We have all carefully studied your excellent preparations, and I have read the articles by Leishman and you. I have also sent your drawings and specimens to Leishman and enclose a copy of his reply. You will see that

* In view of the importance of the discovery of these bodies by Leishman and Donovan, and the recent discovery by L. Rogers as to their being trypanosomés, we publish this report on Major Donovan's original cases from the Annual Report of the Government General Hospital, Madras.—ED., *Indian Medical Gazette.*

he considers the parasites found by you to be the same as his. I think that the bodies are certainly parasites, but I cannot see any evidence at all that they are related to trypanosomes . . . Hence I feel very strongly that the parasite is an entirely novel one, and that therefore consider that the discovery is one of great importance . . . It is possible that the parasites are the cause of the fever in the cases, and this fever appears to me to resemble that of Kala-azar."

On the 5th November 1903, a contribution was sent by me to the *British Medical Journal*: "On the Etiology of one of the heterogeneous fevers of India." This appeared in that periodical of 28th November 1903, page 1401; in this I stated that the bodies had been determined by Laveran and Mesnil to belong to the genus Piroplasma, species new.

The symptoms caused by these organisms appeared to me from the very commencement to be very like those of Kala-azar, but not having seen a case of this disease of Assam I was chary in deciding. My students of their own accord often discussed with me, Manson's small book in hand, the similarity of the two ailments. With the hope of procuring blood from the spleen of Kala-azar cases, I sent a letter on the 10th November 1903 to the *Indian Medical Gazette*, which was duly published in December 1903, on "A possible cause of Kala-azar." In this I mentioned that the symptoms of my cases, which had then amounted to 17, tallied very closely with those of Kala-azar, and that I was led to believe the cause might be identical at the same time requesting medical officers in endemic areas to send me slides of smears of spleen juice or blood obtained by puncture intra vitam.

In the *Bulletin de l'Académie de Medécine*, Paris, No. 35, Séance du 3 Novembre 1903. Laveran described my parasite and he and Mesnil gave it the name of Piroplasma Donovani. Later Laveran and Mesnil contributed a paper to the Académie des Sciences, Paris; a copy of this I give *verbatim*, as it is of importance that the original description should be on record in this hospital. [A translation of this appeared in *Indian Medical Gazette*, August, 1904.—ED., *Indian Medical Gazette*.]

I have nothing to add to the descriptions made by these two French savants. There is nothing definite to note about the parasite seen in the fresh blood, they can barely be discerned, the two chromatin spots appear as brightly refractile areas, there are no movements in the free forms.

The *post-mortem* find is generally, an enlarged, pigmented or unpigmented, spleen; liver enlarged, congested or cirrhosed; intestines, especially the large, deeply congested, inflamed or ulcerated. Details of the necropsies will be found with the summaries given of the several cases further on. On the 23rd December 1903, I received a wire, despatched 22nd idem, from Dr. C. A. Bentley of Assam, to the effect that—"Similar bodies to those described by Leishman and you, found *intra vitam* in Kala-azar." This communication was evidently the result of my letter to the *Indian Medical Gazette* of December 1903. I have since received a slide from Dr. Bentley containing blood of a Kala-azar case; Piroplasma Donovani were present in large numbers. Thus my surmise, that these so-called chronic malaria cases were identical with Kala-azar was correct.

This Piroplasma (whose place in this genus is doubted by Ross, Manson and others, but I shall not enter into details on this subject), is found in the spleen in varying numbers, from 30 and more to one in a field, in some cases the slide has to be examined for half-an-hour before four or five are found; it is also found in the liver, kidneys and suprarenals. In the peripheral blood it is very rarely found, and only when the temperature is high, above 104° F. later; also found in ulcers most probably caused by an itch mite, Surcoptes scabiei. Several of my patients suffering from Piroplasmosis are covered with itch, the itch mite has so far eluded detection. In case 45 I found on the 13th February 1904, the usual Piroplasmata in scrapings from small ulcers in the skin of the lower extremities; I was led to look for the organisms in such skin lesions by Wright's of Boston, discovery of bodies very similar, if not identical, with mine in scrapings from Oriental Sore (Delhi Boil.)

Up to the end of the year under report, 31 cases were admitted into my wards; the admission since 17th June 1903, number among Europeans and Eurasians 211, and natives 507, a total of 718, this gives a percentage of 4·31 suffering from Piroplasmosis; as but one case occurred among Europeans and Eurasians, the natives only should be taken into account, *i.e.*, 30 cases in an admission of 507 or 5·91 per cent. Of these 13 died, four were removed moribund, 13 were discharged at their own request always in a worse condition than on admission, and one still remains in hospital. At date of writing this report the number of cases of Piroplasmosis has gone up to 46, *i.e.*, in my wards only. Lieut. Christophers, I.M.S., informs me that he has had during the last month (part of January and February 1904) 18 cases from the other Physicians' wards. The disease is very common in Madras, especially in Black Town, and generally speaking all cases of that convenient disease "chronic malaria" or "malarial cachexia" are nothing but Piroplasmosis. I give in tabular form the number, names, dates of admission and discharge with remarks of the 31 cases admitted into my wards during the year, *i.e.*, since 17th June 1903, the date of the first case found by me in my wards. The diagnoses were always made from microscopical examination of the blood taken during life from puncture of the spleen.

Table of cases of Piroplasmosis admitted into Second Physician's Wards during 1903.

No.	Name.	Residence.	Date of admission.	Discharge.	Remarks.
1	Doraisami Mudali ...	Periyamett ...	20 May 1903	15Oct. 1903	Died.
2	Shumugam Nadar ...	Black Town ...	30 June 1903	10 July 1903	Do.
3	Munisami	Do. ...	9 July 1903	9 Aug. 1903	At own request.
4	Rajamannar	Do. ...	29 July 1903	18 Sept. 1903	Do.
5	Thungavelu	Do. ...	7 Aug. 1903 5 Dec. 1903	26 Aug. 1903 11 Dec. 1903	Two admissions. At own request.
6	Murugesa Naicker ...	Triplicane .	6 Aug. 1903	26 Aug. 1903	Do.
7	Venkatarajalu	Mint Street ..	28 Aug. 1903	1 Sept. 1903	Removed moribund.
8	Vedachellam	Perambur ...	2 Sept. 1903	28 Nov. 1903	At own request.
9	Ponnusami	Ponneri	29 July 1903 23 Oct. 1903	25 Sept. 1903 23 Nov. 1903	Two admissions. Removed moribund.
10	Raghavan Chetti ...	Do.	7 Sept. 1903	15 Oct. 1903	Do.
11	Doraisami	Black Town ...	21 Sept. 1303	9 Oct. 1903	Died.
12	Ponnusami	Chintadripett ...	26 Sept. 1903	14 Oct. 1903	At own request.
13	Chinnappen	Pudupett ...	14 Sept. 1903	8 Nov. 1903	Do.
14	N. W. Johnson	Rangoon ...	5 Oct. 1903	6 Dec. 1903	Do.
15	Mari	Choolai	31 Oct. 1903	20 Nov. 1903	Died.
16	Guruvan	Kilpauk	23 Oct. 1903	14 Dec. 1903	At own request.
17	Vartharajulu	Choolai	14 Oct. 1903	13 Nov. 1903	
18	Subrayalu	Mint Street ..	6 Nov. 1903	12 Nov. 1903	Died.
19	Anthony	Royapuram ...	14 Nov. 1903	1 Dec. 1903	Do.
20	A. John	Black Town ...	17 Nov. 1903	4 Dec. 1903	Removed moribund.
21	Buchi Raja	Elephant Gate ...	23 Nov. 1903	4 Dec. 1903	At own request.
22	Jaganathan	Ennur	25 Nov. 1903	26 Nov. 1903	Died.
23	Sivanantham	Black Town ...	1 Dec. 1903	...	Still in hospital.
24	Narainsami	Do. ...	17 Sept. 1903 12 Nov. 1903	8 Nov. 1903 26 Dec. 1903	Died.
25	Manikavelue	Mint Street ...	5 Dec. 1903	8 Jan. 1904	At own request.
26	Munisami	Washermanpett ...	1 Dec. 1903	30 Dec. 1903	Died.
27	Kuppusami Naidu ...	Mint Street ...	6 Dec. 1903 11 Jan. 1904	3 Jan. 1904 19 Jan. 1904	Died.
28	Nathamani	Elephant Gate ...	17 Dec. 1903	19 Dec. 1903	Do.
29	Munisami Naicker ...	Mint Street ...	22 Dec. 1903	5 Jan. 1904	At own request.
30	Raghavan	Periyamett ...	26 Dec. 1903	29 Dec. 1903	Died.
31	Chellappan Naicker ...	Pursewakum ...	28 Dec. 1903	31 Dec. 1903	Do.

I may mention that 44 punctures of the spleen were made *intra vitam* (66 up to 22nd February 1904); as a rule, there was no untoward result but one case died from puncture. The patient, case 22, was punctured at 8 A.M., was quite well till 3 P.M., when he was allowed to get up and leave his bed. When walking in the verandah to fetch water, he slipped and fell, was picked up in a dazed condition; at 5 P.M., he was noticed to be very bad, gasping for breath, a few minutes afterwards he expired. *Post-mortem* examination showed extensive hæmorrhage in the peritoneal cavity, obviously from the spleen puncture; the capsule of the spleen was greatly thickened and the pulp unusually diffluent.

Since this regrettable accident, patients were kept for 24 hours flat on their backs and not allowed to leave their beds, at the same time chloride of calcium in a 15-grain dose was administered immediately after puncture and repeated two or three times every three hours; the results so far have been satisfactory.

Several of these punctures were made for other purposes besides that for Piroplasmosis, for instance, for Löwit's parasite in leucæmia and the resistant forms of malaria.

The symptoms are in typical cases:—an irregular pyrexia of two or three months' duration accompanied with shivering with apyrexial gaps. About this time the spleen gets enlarged and painful, and œdema of the feet begins; there is usually diarrhœa of a dysenteric nature, which comes and goes for a week or so at a time, later the lungs are affected, there is cough and expectoration, enlargement of the liver, ascites (unusual), subcutaneous hæmorrhages of a petechial nature, soreness of the mouth, gums or hard palate and cancrum oris. Marked emaciation and weakness supervene, the skin becomes dry and furfuraceous and if the patient is not washed, his skin takes on a dark colouration. In the majority of the cases there are signs of recent or chronic itch, the cause of this skin affection is at present doubtful, but it is probably brought about by one of the acarina. The blood examination in cases of piroplasma infection always shows a marked decrease of the red blood corpuscles, these vary from two to three millions to the cubic millimetre. There is no actual increase of the leucocytes but a relative one of the mononuclears, as in malaria. The urine usually contains albumin and invariably pigment urobilin. The fæces in some cases contain balantidia, ankylostomata and rhabdonemata. Quinine has been given by mouth, hypodermically and intramuscularly *ad nauseam*, with no appreciable result. The same may be said of other less suitable drugs, *i.e.*, arsenic, salicylate of sodium, carbolic acid, etc. I here give a very short summary of the 31 cases admitted during the year.

1. Doraisami Mudali, a sickly thin boy, aged 12 years, was born and lived at Periyamett, admitted 20th May 1903, for enlarged spleen, liver and irregular pyrexia. Fever of a month's duration with shivering, spleen noticed to enlarge about three weeks ago, had occasional œdema of the feet. His spleen extends down to the umbilicus, liver half an inch below costal arch; he became gradually thinner and thinner with occasional attacks of dysenteric diarrhœa and died on the 15th November with very severe cancrum oris and extensive petechiæ over his chest and abdomen. Temperature chart is attached. No *post-mortem* was allowed.

2. Shumugam, an unhealthy and emaciated boy, aged 13 years, lived in Black Town, admitted 30th June 1903 with irregular pyrexia of two years' duration, enlargement of spleen and œdema of feet. The spleen was down to the umbilicus, liver 2 inches below costal arch, œdema of the feet well marked; temperature never above 103° F., died on the 10th July, 11th day of admission.

3. Munisami, a thin boy, aged 12 years, lives in Black Town, history of fever for a month before admission, 9th July 1903. Slight enlargement of the spleen, none of the liver, very slight œdema of the feet. Discharged at his own request, 8th August 1903.

4. Rajamannar, a rather healthy looking boy, aged 15 years, lives in Black Town, has had fever for 15 days before admission on 29th July 1903. Spleen enlarged half way down to umbilicus, liver about an inch below costal arch; his feet swell occasionally, has had one go of diarrhœa, latterly had bronchitis; he became thinner and weaker and was discharged on 18th September 1903.

5. Thungavelu, a wretched, thin, half-starved boy, aged 14 years, lives in Black Town; fever for a month outside. Was admitted twice in hospital, in August for twenty days and again in December for 7 days; on the latter occasion for a severe attack of cancrum oris; was discharged moribund 11th December 1903. During his stay in hospital he had very little pyrexia, not above 102° F. Spleen slighty enlarged, liver normal and œdema of feet.

6. Murugesa Naicker, a thin man, aged 30, lives in Triplicane, admitted beginning of August and discharged 26th of the same month. Spleen slightly enlarged, liver normal, no œdema of feet; temperature reached 103° F. on two occasions only.

7 Venkatarajalu, a bullock-cart driver, aged 40 years, lives in Mint Street, ill for 20 days. Admitted 28th August 1903 very ill, spleen enlarged to umbilicus liver normal and diarrhœa present; removed moribund, 1st September 1903; temperature ranged from 100° to 104° F

8. Vedachellam, a healthy looking and well-built boy, aged 12 years, lives at Perambur, fever 1½ month's duration. Spleen enlarged to umbilicus, liver normal no diarrhœa and no œdema of the feet; during his stay in hospital for over two months had irregular pyrexia and had become a little thinner when discharged.

9. Ponnusami, a thin, very dark man, aged 28 years, a cartman from Ponneri, was admitted twice, has had fever for three months before the first admission. Spleen very slightly enlarged, liver normal, no œdema of feet, had ulceration of his mouth a few days before his discharge.

10. Raghavan Chetti, aged 12 years, comes from Ponneri, fever for three months. Spleen enlarged half way to umbilicus, liver normal, feet œdematous, had an extensive crop of petechiæ over chest and front of ankles; temperature very irregular, discharged moribund.

11. Doraisami, a thin boy, aged 13 years, from Black Town. History of fever of long duration; liver and spleen considerably enlarged, œdema of feet and bronchitis. Died on 9th October; a very partial *post-mortem* allowed by relatives; liver and spleen removed, both much enlarged and congested but non-pigmented.

12. Ponnusami, a cook, aged 20 years. lives in Chintadripet, fever for four months. Spleen slightly enlarged, liver normal, very mild pyrexia, stopped 19 days in hospital.

13. Chinnappen, a milkman, aged 34 years, lived in Pudupett, fever of short duration prior to admission for dysenteric motions. Temperature varying from normal to 101° F., spleen enlarged, about four fingers' breadth below ribs, liver normal, occasional œdema of feet, had dysenteric motions during the whole of his two months' stay in hospital.

14. N. W. Johnson, a very emaciated and feeble Eurasian, aged 24 years, has had a very long spell of fever, first contracted in Rangoon. Has a huge spleen extending down to his pelvis and liver descending below the umbilicus; the abdomen is completely filled up by these two viscera; there is marked mottling or pigmentation of the skin, has occasional eruptions of petechiæ, epistaxis, slight bronchitis and the usual irregular temperature with night sweats. I append patient's own account of his case, dated 9th October 1903. "About very nearly four years ago I was appointed as clerk in charge of Segregation Camp, Rangoon. The camp was built on a disused paddy field just along the river's bank. During my first four months' stay at the camp I kept very good health, but as we were getting deeper into the monsoon the condition of the camp became a proper marsh, there were standing pools of water and the soil became so soft that it was with very

great difficulty one could walk. It was at this time I got my first attack of fever and was treated by the hospital assistant I became worse and was compelled to get admitted in the Rangoon General Hospital, this was in July 1900. I was about three weeks in hospital when I was discharged having no fever. I resumed work and continued to work for about a week, when I got a relapse. The second attack was more severe than the first and I neglected myself more as I was chary of asking for more leave. I became so bad however that the Port Health Officer came to hear of it, and ordered me into hospital, which I obeyed; this was about the middle of August 1900. I was not more than two days in hospital when the fever left me, this happened also on the first occasion. I therefore decided to resign my appointment and leave Burma for good; this I did and landed here about the middle of September. I kept fairly good health here and was able to put on flesh. This, however, did not last long. I started getting fever till at last I got admitted into this hospital somewhere in October or November. It was the same here as in Rangoon, on the second day of my admission the fever left me and about ten days after I left the hospital. My next admission in this hospital was in June 1901, fever again; after a stay of about a fortnight, I left; my spleen then was slightly enlarged but not to such an extent as to demand treatment. By this time I got tired of Madras and was determined to go back to Rangoon. I sailed from here on the 12th September 1901, arrived in Rangoon on the 16th September and by the 1st October I was working in the Agent's office, Burma Railways, my health greatly improved. I was forced to enter hospital, this time not with fever but with a bubo. I was operated on and cured and left the hospital on the 10th January 1902 (I was admitted on the 19th November 1901.) From this date my proper troubles about the spleen began. When I left hospital I had no job and had to rough it till I found a living; in this style I began getting fever again. To make matters worse I took up a tally clerk's job, a job where you work aboard a ship either by day or night for 12 hours at a time, subject to the heavy dews of night and the excessive heat by day. I managed to pull on with this up to the end of March 1902, but had to throw up the sponge at last and seek admission in hospital in April 1902. I was examined on admission and was told I had a spleen abnormally enlarged; this surprised me, as not more than three months back my stomach appeared to be in no way affected. I was four months in hospital and left strong enough to take up a clerk's berth on board the B. I. S. N. steamer "*Chilka.*" I worked for about four months, put on some flesh and looked and felt a great deal better. Since leaving hospital I took bad again with fever on one of our visits to Rangoon, and was forced to lay up again for a month, this was in the beginning of November. I got out again on the 2nd December, got appointed to another ship on the 9th, worked for another four months, got another relapse in March, got admitted again in hospital in April 1903. Left in August for the Calcutta hospital, stayed there for a month. Having found no improvement came down to Madras on the 7th September, kept fairly good health for about ten days, gained 7 lb. in flesh since leaving Calcutta, got a relapse of fever about the 20th, became very bad about two days before admission here, fever every nigl t at 8 P.M. 104·6° F. Monday morning the 5th I was admitted. This is a true account of my case. I may add that although I kept good health on board, my spleen was the same in size. As regards my mode of living when in Rangoon it, I am ashamed to confess, was rather fast. I was inclined to be intemperate before joining the camp. On joining fever and plague were made an excuse to drink heavy, on board a ship it was worse, I drank more whilst working afloat than I did ashore. I put this down as it may help you in finding out the cause of my spleen, and besides I wish to tell the whole truth."

It is difficult to state where this patient contracted his present ailment, he probably had malarial fever in Rangoon and subsequently got Piroplasmosis in Black Town; but this is mere surmise. He was in hospital for two months and left at his own request, weaker and thinner than on admission. (He sought admission again this month, February 1904; he has become much worse. He has since died).

15. Mari, an emaciated young man, aged 20 years, worked in the Buckingham Cotton Mills and lived in Choolai; history of fever off and on for six months. There was enlargement of liver and spleen, dysenteric motions, temperature between 99° and 102° F., ulceration of gums over the last two upper molars of the left side, two ulcers on the outer side of the left knee and one in the gluteal region of the same side. Died on the 21st day of his admission. *Post-mortem* was held by Captain Kirkpatrick, I.M.S., and the following notes were taken:—Height 5 feet, weight 76 lb. Rigor mortis is passing off. Œdema of legs. Abdomen opened. Intestines semi-distended and pale; abdomen contains about 6 oz. of darkish yellow fluid; the omentum is pigmented; the parietal peritoneum has also pigmented patches; the lower part of the ileum is coiled and twisted in the right iliac region, the coils being bound to each other and to the ascending colon by adhesions, the adhesions are firm; the vermiform appendix is healthy.

Thorax opened The pleural cavity contains a small quantity of fluid; some adhesions on both sides; left lung is adherent to the diaphragm. Pericardium contains 2½ oz. of clear fluid. Heart—Left auricle is the only chamber that contains any blood, of a dark fluid nature; endocardium is healthy; valves are competent; coronary arteries healthy; the heart muscle appears normal. Trachea, vessels dilated and full of blood; pretracheal and bronchial glands are enlarged. Lungs —Right lung, middle lobe is absent; the pulmonary veins are full of blood; section moist, dark and firm. Intestines—Contain a quantity of dirty grey semi-fluid materials. Transverse and descending colon are covered by a number of small dark red purple ulcers, which are mostly discrete, but in places they run together; these extend as far as the muscular coat, there is little thickening around them; in the washings a number of sloughs were found; the jejunum is congested in places; the rectum contains some blood-stained fluid and the sigmoid flexure shows the same appearances as the colon. Spleen large, shapeless, soft, not very moist, dark and pigmented. Liver is large, dark and flabby; on section the substance is rather friable, shows pigmentation with small specks of yellowish colour intervening, uniformly spread all over the viscus. Kidneys, colour is yellow and pale; capsules strip easily. Brain —Cerebral vessels contain a small quantity of blood; slight pigmentation at the base of the brain; the brain substance is very soft, otherwise nothing abnormal is noted.

Weights—spleen 49 oz. and liver 72 oz.

16. Guruvan, aged 35, lives in Kilpauk; fever for three months and diarrhœa for one month before admission. Spleen enlarged one inch below costal arch, liver barely larger than normal, œdema of feet; discharged after a month and a half in hospital.

17. Vartharajalu, a fairly healthy young man, aged 18 years, lives at Choolai, had fever for two months and spleen enlarged one month before admission. Spleen descends below umbilicus, liver slightly enlarged with œdema of feet. Discharged after a month's stay in hospital.

18. Subrayalu, a puny, wretched looking man, aged 25 years, lived in Mint Street. Admitted for dysentery, after eight days in hospital died of peritonitis. He had fever off and on for six months before admission. *Post-mortem* made by Captain Kirkpatrick, I.M.S

Height, 4 feet 7 inches; weight, 52 lbs. Abdomen opened—Intestines distended, vessels on surface of small intestines are injected cavity contains about 5 oz. of clear

yellow fluid ; liver surface is covered with thin flakes of lymph ; the omentum and transverse colon are adherent to the anterior wall, signs of old peritonitis. On separating the abdominal wall gently, a perforation, the size of a pea, is found on the anterior surface of the transverse colon, the sigmoid flexure is adherent to the anterior abdominal wall. Ileum shows areas of inflammation having dark-red ecchymosed patches ; its wall is pigmented ; in the large intestine are a number of chronic ulcers whose edges are much raised and thickened and their floors covered by thick yellowish adherent slough, some of these extend through the whole wall of the gut. Spleen is large, capsule thickened in patches, there is a small white infarct on its anterior border, the section is dark and substance firm. Liver, surface irregular covered with small adhesions, patches of thickened capsule ; section is tough, very dark, and there is an excess of fibrous tissue and pigment. Weights—spleen, 21 oz. ; liver, 33 oz.

19. Anthony, a very sickly looking Police constable, lived at Royapuram, had irregular fever for six months accompanied by shivering and occasional swelling of the legs ; spleen very slightly enlarged, liver normal, had troublesome cough and soreness of his mouth, died on the 18th day of his admission.

20. A. John, a sickly man, aged 43 years, lives in Black Town ; has had fever for two years irregularly, during the last seven months accompanied by dysenteric motions. Spleen enlarged to umbilicus, liver normal, has spongy gums and dysenteric motions, temperature normal throughout the 18 days of his stay in hospital, discharged moribund.

21. Buchi Raja, a very thin though otherwise healthy-looking boy, aged 14 years, lives near Elephant Gate ; history of fever of a year's duration with enlargement of the spleen. Very slight pyrexia during his stay in hospital ; spleen extends down to the umbilicus, liver two fingers' breadth below costal arch, no diarrhœa and no œdema of the feet.

22, Jaganathan, a spare, large-boned man, aged 35 years, lived at Ennur, complained of enlarged spleen and pyrexia of long duration. This man died from spleen puncture, an account of which has already been given.

Post-mortem notes by Captain Kirkpatrick, I.M.S.—Spleen is large, the capsule is tough ; at its anterior border and outer surfaces are three small punctures the centre one of which is somewhat linear ; the substance of the spleen is very soft and slightly pigmented, weight, 60 oz. Liver is rather pale, there are racemose pigmented markings ; substance is firm ; weight, 62 ounces.

23. Sivanantham, a sickly-looking *byragi*, aged 25 years, lives at Black Town, fever and œdema of feet of two months' duration. This patient's temperature was of a most marked intermittent type, the chart is attached. He has had occasional petechiæ and swellings of the feet with bronchitis. Latterly he greatly improved, his spleen decreased in size almost to normal, the œdema of the feet left him and the temperature was very little above normal. But this false improvment has not lasted, when writing this report, his previous unhealthy condition is returning.

24. Narainsami, an emaciated, very dark-complexioned man, aged 35 years, lived at Black Town; history of fever of two months' duration with dysenteric motions.

Was three months in hospital suffering from typical pyrexia, dysenteric motions, cough, œdema of feet and soreness of mouth. The strange feature about this case was that the spleen and liver were not enlarged, and it was with some difficulty that the spleen could be punctured. He died and a necropsy was held by me, the following special features were noted :—Fourteen ounces of blood-stained fluid in the abdominal cavity; parietal peritonium, especially in the pelvis and sides, mesentery and omentum, covered with numerous petichial spots of recent origin, some, however, appear old, like mili-miliary tubercles. Intestines, lower part of the large, inflamed and ulcerated. Spleen normal, of a brownish pink colour, non-pigmented. Liver very slightly enlarged, congested non-pigmented Suprarenals enlarged. The other viscera call for no mention.

25. Manika Velu, a spare young man, aged 20 years, lives in Mint Street ; fever irregularly for four months, spleen enlarged two months ago, latterly he has had soreness of the mouth and œdema of the feet. Spleen enlarged to umbilicus, liver three fingers' breadth below costal arch ; after a month in hospital discharged in the same condition as on admission ; pyrexia varied from normal, to 102° F.

26. Munisami, a very sickly and emaciated boy, aged 14 years, lived in Washermanpett. Has had fever irregularly for two months, with sore mouth, diarrhœa and œdema of feet. Spleen and liver slightly enlarged. Was admitted on 1st December 1903, kept fairly well until 21st idem when symptoms of the disease became worse and he died on the 30th idem from œdema of the larynx. The following are part of the notes taken :—

21st December 1903. Œdema of the feet increasing, has a troublesome cough with expectoration.

25th December 1903. Has three sores, about half an inch in diameter, on and round left knee, resembling those caused by scratching pustules of itch (Sarcoptes scabiei) ; œdema of left foot much less ; complains of pain in the left ear with a buzzing noise.

28th December 1903. Discharge of pus from the left ear, marked swelling below the ear and extending down the neck.

29th December 1903. Pus discharging from both ears ; left tonsil very much congested with a dirty looking slough, œdema of the fauces ; swelling has increased over left lower jaw and neck, very painful to the touch.

30th December 1903. At 3-30 A.M. had great difficulty in breathing. Neck much swollen, purulent discharge from both ears profuse ; marked œdema of fauces with almost complete closure of the isthmus faucium ; slough on left tonsil has spread Tracheotomy was performed at 8 A.M., and the patient died at 10-10 P.M. The temperature was of an intermittent type throughout, varying from 98° to 104° F.

Post mortem.—The spleen enlarged, slate grey in colour, pigmented, weighed 16 ounces. Liver adherent to stomach and deodenum, nutmeg, weight 48 ounces. Kidneys and large intestines healthy. Ileum congested, Several round worms, no ankylostomata.

27. Kuppusami Naidu, aged 30 years ; admitted for ascites, diarrhœa, cough and enlargement of spleen ; lives in Mint Street. Fever for about eight months, of an irregular type, spleen enlargement noticed six months ago, swelling of abdomen of five months' duration ; associated with these were occasional bleedings from his gums, sore mouth and œdema of the feet. Spleen and liver slightly enlarged, abdominal cavity full of fluid, well marked pleuritic rub on right side and friction sounds over liver and spleen. Feet much swollen, skin dry, covered with dirty black epithelial scales ; petechiæ over chest, coming out in crops : has diarrhœa, motions passed in bed. Hands covered with itch, few itch scabs on front of chest and small ulcers on ankles, was admitted twice, on the second occasion he was very ill and died on the eighth day.

The *post-mortem* notes were—Body thin and ill-developed, abdomen distended. Fifty-two ounces of thick yellowish fluid in abdominal cavity.

Liver, large congested, slightly nutmeg, no pigment, was adherent to stomach, duodenum, colon and diaphragm, and weighed 65 ounces. Spleen much enlarged, soft, no pigment, weight, 26 ounces. Intestines both small and large, matted together with adhesions; Peyer's patches congested. Superficial ulcers in transverse and

descending colon. Few ankylostoma found in the intestines.

28. Nathamani, aged 13 years, lived at Elephant Gate, admitted for peritonitis. Fever for the last six months with diarrhœa. On admission had marked distension of the abdomen and dyspnœa; septic peritonitis was diagnosed; he died on the third day of admission No *post-mortem* allowed.

29. Munisami Naicker, a week-minded and sickly-looking young man, aged 18 years, lives in Mint Street. Fever for four months, with enlargement of the spleen, has had soreness of the mouth, and œdema of the mouth on occasions. Spleen much enlarged, 3 inches below the umbilicus; liver just below costal arch; has pain and slight swelling over left antrum. Discharged at his own request after nearly two months in hospital, his temperature during this period was of an irregular type.

30. Raghavan, aged 30 years, lived at Periyamett. Fever irregularly for a month and a half, spleen enlargement noticed a month ago, during this period he had occasional attacks of diarrhœa and soreness of the mouth. Admitted for dirrahœa and distension of the abdomen; his spleen and liver were enlarged and he had œdema of the feet. He died on the fourth day of his admission. The *post-mortem* was made by Captain Symons, I.M.S, and the following notes were recorded :—Considerable amount of clear fluid with floating lymph in abdomen. Colon at splenic flexure, gangrenous; transverse colon much thickened, almost half-an-inch in places and ulcerated, containing raised papillæ on the mucous surface of a bright red colour; descending colon a dark grey colour; spleen much enlarged with pigment in patches; liver enlarged, 2½ lbs. in weight.

31. Chellappan Naicker, a sickly- man, aged 37 years, lives in Pursewakum; has had fever for seven months and diarrhœa for the last 15 days. Very ill when admitted, died on the fourth day of admisson Spleen slightly enlarged (19 ounces), liver normal. Temperature of an interment type, varied form 98° to 103° F.

"A METHOD OF PREVENTING DEATH FROM SNAKE BITE, CAPABLE OF COMMON AND EASY PRACTICAL APPLICATION.

BY SIR LAUDER BRUNTON, M.D., F.R.S., SIR JOSEPH FAYRER, *Bart*, K.C.S.I., F.R.S, AND LEONARD ROGERS, M.D., B.S., I.M.S.,

Received February 22—Read, 5th May 1904.[1]

ALTHOUGH this paper is a joint one, the authors wish to mention that each has had a different part in its production. The whole research may be fairly regarded as the natural outcome of the work begun in India nearly forty years ago by one of us (Fayrer), and this is the only ground on which his name can be associated with this paper. The instrument employed was designed by another of us (Brunton), and the actual experimental work was entirely carried out by a third (Rogers).

The first experiments on the use of permanganate of potash as an antidote to snake poison was made by one of us (Fayrer), in 1869, both by the local application of a solution and by injection into the veins,[2] on the ground of its being a chemical antidote. The animals experimented upon were dogs, but the permanganate of potash did not seem to have any power to avert the lethal action of the poison. It was shown also by Wynter Blyth[3] that Cobra venom when mixed *in vitro* with permanganate of potash becomes innocuous. His results were confirmed by two of us, who showed that some other substances had a similar power.[4] They tried by the injection of strong solution of permanganate of potash and also by its local application to an incision made over the bite to destroy the lethal action of Cobra poison previously injected, but their experiments were unsuccessful, the permanganate appearing to be unable to overtake the poison which had got the start of it.

In 1881 Messrs. Couty and Lacerda[5] made a number of experiments upon the effect of permanganate of potash on serpents' venom and Lacerda found that permanganate of potash not only destroyed the lethal action of the venom when mixed with it *in vitro*, but also preserved life when a 1 per cent. solution of permanganate was injected into the tissues close to the place where the venom had been previously injected and also when both venom and antidote were injected directly into the vein. At the time of presenting his note to the Academy of Science in Paris, M. Lacerda was apparently unaware of the previous experiments by Blyth, Brunton and Fayrer. In a later publication[6] he discusses their experiments, but claims for himself to have scientifically demonstrated permanganate of potash to be a precious antidote to serpent venom, and to have brought it into common use and thinks, therefore, that the priority belongs to him, but he was apparently unaware that instructions for its use with the ligature had, many years before, been promulgated by Fayrer in India.

In the winter of 1881 a number of experiments were made by Dr. Vincent Richards, who found, like the previous experimenters, that Cobra poison was completely destroyed by permanganate of potash when mixed with it *in vitro*, so that death did not follow the injection of the mixture either hypodermically or into a vein. He found also that when Cobra poison was injected into a dog and the injection followed either immediately or after an interval of four minutes by a hypodermic injection into the same part of a solution of permanganate of potash no symptoms of Cobra poisoning resulted,

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[1] Read before the Royal Society and sent by Secretary for publication. ED.—*Indian Medical Gazette.*

[2] 'The Thanatophidia of India,' 1872, p. 95, by J. Fayrer, M.D. London: J. and A. Churchill.

[3] "The Poison of the Cobra," by A. Wynter Blyth, M.R.C.S., 'The Analyst,' 28th February, 1877, p. 204.

[4] "Note on the effect of various substances in destroying the Activity of Cobra Poison," Brunton and Fayrer, 'Roy. Soc. Proc.,' 20th June 1878, vol. 27, p. 465.

[5] Couty and Lacerda, 'Comptes Rendus,' vol. 92, p. 465.

[6] Lacerda, 'Comptes Rendus,' vol. 93, p. 466.

but after the development of symptoms of Cobra poisoning, permanganate of potash failed to have any effect whether injected locally or into a vein, or both.

These results, obtained both by Lacerda[7] and Richards, seemed to give good hope that permanganate of potash might be used to lessen the appalling fatalities from snake-bite in India, but it is evident that the hypodermic injection of a solution can never be widely employed because the hypodermic syringe is expensive, it is liable to get out of order just at the times that it is wanted and the solution may become dried or spilt or may not be available. It is evident that the first requisite for any antidote to snake poisoning is that it shall be always at hand; second, that it shall be easily applied; and thirdly, that it shall be cheap.

About two years ago one of us (Brunton), was asked on behalf of a young officer going out to India, to design an instrument which might be used in case of snake-bite. He did so accordingly, and he has since had a similar one made for him by Messrs. Arnold and Sons, which seems to combine the three requisites just noted. It consists of a lancet-shaped blade about half an inch long, long enough, in fact, to reach the deepest point of a bite by the largest snake. He has had some instruments made with a double-edge like an ordinary lancet, and others with one edge sharp and the other edge blunt, so as to press in the permanganate. The lancet is set in a wooden handle about an inch and a half long, which is hollowed at the other end so as to form a receptacle to hold the permanganate. Two wooden caps are fitted over the ends of the instrument, one to keep in the permanganate, and the other to protect the lancet. Such an instrument, if turned out in large numbers, could be sold at such a small price as to be within reach of even the Indian labourer and might be sold everywhere in the same way as packets of quinine are at present.

The plan now proposed is to make a free opening into the site of the bite, and to rub in crystals of permanganate. For this purpose the limb should be surrounded by a tight bandage above the bite, the puncture of the tooth or teeth should be freely cut into by the lance-shaped blade and the crystals of permanganate introduced and rubbed round. A few drops of saliva may be added.

To test the efficacy of the proposed plan, several lethal doses of venom dissolved in a few drops of water, so as to resemble, as far as possible, the natural poison, are to be injected into the limb of an animal, a ligature placed round the limb above the seat of injection, an incision made, and crystals of permanganate placed in the wound, moistened and rubbed in.

Experimental Investigation by Leonard Rogers.

In order to test in as practical a manner as possible the value of the suggestion of the first two named authors of this communication, the following experiments were carried out at the Physiological Laboratory of the London University by the third-named author. In the first place it was necessary to ascertain if crystals of permanganate destroy the activity of other venoms besides that of the Cobra, for we are not aware that its action in this direction has been tested against any extensive series of snake venoms. As the value of the suggested treatment would evidently be greatly enhanced if the permanganate could be shown to act efficiently against every class of snake venom, a series of experiments were carried out to test this point. The venoms in solution were mixed with small quantities of a 10 per cent. solution of pure crystalline permanganate of potash in 0·9 per cent. NaCl, and after given times the mixtures were injected into pigeons, several times, a lethal dose of each venom being used, so that if recovery took place it would be evident that the permanganate had destroyed the activity of the poisons. Table I summarises the results of these experiments:—

It will be seen that Table I includes venoms of each main subdivision of snakes, namely, the two true vipers, the *Daboia Russellii* of India and the Puff Adder of Africa, the Pit Viper, the *Crotalus horridus*, the Colubrine snake the *Bungarus fasciatus*, and one of the Hydrophidæ or Sea-snakes, namely, the *Enhydrina bengalensis*. In the case of each, ten or more lethal doses were neutralised by very small quantities of permanganate in solution, and in most of them twenty lethal doses were readily thus rendered harmless. The only failure was in Experiment 7, in which 32·2 milligrammes of *Bungarus fasciatus* venom was added to 25 milligrammes of permanganate of potash in solution, and in this case by far the greater part of the poison must have been neutralised, for in previous experiments one-eighteenth part of the venom per kilogramme, used in Experiment 7, killed a pigeon in one hour. Further experiments showed that 25 milligrammes of the permanganate of potash did entirely neutralise 16·1 milligrammes of *Bungarus fasciatus* venom. It is evident then that the salt will neutralise about its own weight of this venom, but that its power in this direction has a definite limit as might have been expected. It is clear, then, that this agent does act on every class of snake venom and renders them inert.

Owing to the limited time available and the small number of animals for which a license had been obtained, the actual experiments on the treatment after injection of the venoms have been so far limited to those of the Cobra as a

[7] "O Veneno ophidico e seus antidotos," Dr. J. B. de Lacerda, Rio de Janeiro, Lombaerts, &c., 1881, p. 64.

TABLE I.

Number of experiment.	Weight of pigeon.	Dose in milligrammes.	Number of lethal doses.	Dose per kilogramme weight.	Amount of 10 per cent K^2MnO^4.	Time mixed before injection.	Symptoms.	Result.
			I. *Daboia Venom.*					
	grammes.			milligrammes.	c.c.	mins.		
1 ...	350	3·5	3	10	0·5	30	Nil.	Recovered.
2 ...	320	6·2	7	20	0·5	10	Do.	Do.
3 ...	280	14	17	50	0·5	10	Do.	Do.
			II. *Crotalus horridus Venom.*					
4 ...	300	15	10	50	0·5	10	Do.	Do.
			III. *African Puff Adder.*					
5 ...	270	21·6	20	80	0·25	5	Do.	Do.
6 ...	300	12	10	40	0·25	5	Do.	Do.
			IV. *Bungarus fasciatus.*					
7 ...	230	32·2	20	140	0·25	5	Colubrine	Died in 2 hrs.
8 ...	230	16·1	10	70	...	10	Nil.	Recovered.
			V. *Enhydrina bengalensis.*					
9 ...	250	25	20	1	0·25	10	Do.	Do.

TABLE II.—Experiments with Cobra Venom.

No.	Animal.	Weight.	Actual dose.	Dose per kilogramme.	Time of ligature.	Amount of permanganate.	Ligature released after.	RESULT.
		kilogrammes.	milligrammes.	milligrammes.	seconds.	grammes.	mins.	
1	Rabbit ...	1	10	10	30	0.25	2	Died, 1 hr.
2	,, ...	1½	7·5	5	...	...	2½	,, 3½ ,,
3	,, ...	1⅛	3·75	2½	...	...	3½	,, 3½ ,,
4	,, ...	2⅛	2·75	1	...	...	3	,, 3½ ,,
5	,, ...	1·8	1·8	1	...	Nil (control)	...	,, 1½ ,,
6	,, ...	2½	1·25	0·5	30	,,	3½	,, 3½ ,,
7	Cat ...	1⅛	17·5	10	...	0·25	3	Recovered.
8	,, ...	3	30	10	...	Nil (control)	3½	Died, 3 hrs.
9	,, ...	3	15	5	...	0·25	3	Died, 30—38 hrs.
10	,, ...	2⅜	13·75	5	...	...	3½	Recovered.
11	,, ...	4	20	5	5 minutes	...	3½	,,
12	,, ...	3	15	5	...	Nil (control)	3	Died 28 hrs.
13	,, ...	3½	10·5	3	10 minutes	0·25	3½	Recovered.
14	,, ...	2	4	2	5	...	3	,,
15	,, ..	3½	3½	1	...	(Nil control)	...	Died, 50 hrs.

TABLE III.—Experiments with Daboia Venom.

No.	Animal.	Weight.	Actual dose.	Dose per kilogramme.	Time of ligature.	Amount of permanganate.	Ligature released after.	Result.
		kilogrammes.	milligrammes.	milligrammes.		gramme.	minutes.	
16	Rabbit ...	2	100	50	30 secs.	0·25	3½	Died, 9—17 hrs.
17	,, ...	2	20	10	30 ,,	0·25	4	,, 26 ,,
18	,, ...	2	20	10	...	Nil (control)	...	,, 3 ,,
19	,, ...	2⅜	6·875	2·5	30 ,,	,,	2½	Recovered.
20	Cat ...	1¾	87·5	50	30 ,,	0·25	3	,,
21	,, ...	2	100	50	5 mins.	0·25	3½	Died, over 24 hrs.
22	,, ...	2½	125	50	30 secs.	Nil (control)	3	,, 4 ,,
23	,, ...	2	60	30	30 ,,	0·25	3½	Recovered.
24	,, ...	1½	45	30	5 mins.	0·25	3½	,,
25	,, ...	3	90	30	10 ,,	0·25	1½	,,
26	,, ...	2	60	30	30 secs.	Nil (control)	3	Died, 4½ hrs.
27	,, ...	2	20	10	30 ,,	0·25	4	Recovered.
28	,, ...	3	30	10	30 ,,	Nil (control)	3	Died, 30—40 hrs.

typical representative of the Colubrine class, and of the *Daboia Russellii* as a common and deadly viper. Rabbits and cats were used in the investigation, the latter on account of their mixed diet and firmer tissues resembling more closely the human subject. The venoms were dissolved in as small a quantity of sterile normal saline solution (0·9 per cent. NaCl) as possible, so as to resemble in concentration the natural venom. The portion of the limb to be operated on was cleaned of hair by scissors beforehand (as the human subject is free from this obstacle to treatment). The strong solution of venom was then injected into the subcutaneous tissue of the cleaned part of a hind limb a little above the paw, as most snake bites in the human subject occur on the distal parts of the extremities. After a given measured time a ligature consisting of a piece of bandage was tied loosely round the thigh and twisted up tightly by means of a piece of stick or a pencil so as to temporarily stop the circulation through the distal part of the limb in order to check further absorption of the poison. An incision was then made in the long axis of the limb over the seat of injection of the poison, and the edges dissected up slightly on either side so as to fully expose the affected tissues and to form a small pocket, into which the crystals of permanganate were next placed, and after moistening with a few drops of sterile normal salt solution (water, or even saliva, would serve in an emergency) they were well rubbed in until the exposed tissues presented a uniformly blackened appearance. About three minutes were usually occupied by the little operation, on the completion of which the ligature was released, and a dressing and bandage applied to the wound. The animals were under chloroform throughout the operation, including the injection of the venom. The amount of venom held by the instrument made for these experiments was ¼ gramme, this quantity being used in each of the experiments.

The results of the experiments so far performed may most conveniently be summarised in the following table, by means of which they may readily be studied. The actual doses of venoms injected are given in Column 4, and the dose per kilogramme weight in Column 5. The time which was allowed to elapse after the injection of the poison before the application of the ligature (Column 6) was usually ½ minute, which it was calculated would be sufficient to allow a handkerchief, or in the case of a native a strip of a *pugari* or of the cotton garments commonly worn by the poorer classes in the tropics, being tied round the limb and twisted up to form an efficient ligature. In a few of the later experiments this application of the ligature was delayed for five and ten minutes. In Column 8 the time is shown which was taken over the operation from the application to the release of the ligature, while the ultimate result is shown in Column 9. In most of the control experiments a ligature was applied round the thigh for about the same time as in the operations, as it appeared possible that the ligature might delay somewhat the absorption of the poison, although it could scarcely affect the ultimate result of its action, owing to the poison being an essentially cumulative one.

The first six experiments of Table II were performed on rabbits, with the result that only prolongation of life was obtained. Thus, after a dose of 10 milligrammes per kilogramme (Experiment 1), death took place only a little quicker than after one-tenth of this dose in a control animal (Experiment 5). Again 5 milligrammes per kilogramme in a treated animal caused death in 3½ hours (Experiment 2), but 0·5 milligrammes per kilogramme in a control killed in the same time (Experiment 6). The rapidity of death in this last animal shows that 0·5 milligrammes per kilogramme is still much above the minimal lethal dose of cobra venom for rabbits, so that the doses used in the treated cases were many times a lethal dose (about five to fifty times), and were thus mostly proportionally larger doses than a cobra could eject in the case of a man. The tissues of a rabbit are also more delicate than those of a cat or of a man, so that absorption of the poison may be unusually rapid in rabbits, which are extremely susceptible to snake venoms.

Turning next to the results of the experiments on cats, much more satisfactory results were obtained. Thus, the control experiments showed that 1 milligramme per kilogramme preduced death in 50 hours, this being the minimal lethal dose of the cobra venom used in these experiments for cats (Experiment 15). A dose of 5 milligrammes per kilogramme caused death in 28 hours, the time having probably been prolonged by the application of a ligature after the injection (Experiment 12). A dose of 10 milligrammes per kilogramme proved fatal in 3 hours, although a ligature had been applied as in the treated cases (Experiment 8). On comparing the result of treated cases with the above control we find only one death occurred in six experiments. The one fatal result took place after a dose of 5 milligrammes per kilogramme (Experiment 9) this having been the first case treated, in which the permanganate was not as thoroughly rubbed in, and the site of injection was not as completely exposed as in later experiments, and in this case death did not take place until over 30 hours. On the other hand, in Experiment 7, recovery took place after 10 milligrammes per kilogramme (ten lethal doses), while in two other cases recovery took place after five lethal doses had been injected, in one of which (Experiment 11) 5 minutes were allowed to elapse before the treatment was carried out, while in Experiment 13 recovery ensued from lethal doses treated 10 minutes after injection.

The above results are very encouraging, for it appears from D. D. Cunningham's observations that the average amount of venom ejected by a full-sized cobra is not more than ten lethal doses for a man, while other writers give much smaller amounts. Further, in many cases, the full dose will not actually be injected into the human tissue for various reasons.

In Table III a similar series of experiments with daboia venom are summarised. Here, again, in the case of rabbits, only very marked prolongation of life was obtained, although the dose used in Experiment 17 was less than four lethal doses, so that it is clear that in the case of rabbits the method was not very successful.

On the other hand, the experiments with cats were as successful as in those of the cobra series given above; for only one of the six cases treated with permanganate died, and in this instance (Experiment 21) the very large dose of 50 milligrammes per kilogramme was injected, and the treatment was delayed for 5 minutes. This dose is probably relatively larger than could be injected by any known viper in the case of a full-grown man. Further, in this case death did not take place until upwards of 24 hours after the injection, while in a control experiment with the same dose (Experiment 22) a fatal result occurred in 4 hours. Further, with the same large dose recovery took place when treatment was carried out ½ minute after injection. Again, 30 milligrammes per kilogramme (three lethal doses) killed a control cat in 4½ hours, but in three cases treated ½, 5 and 10 minutes respectively after injection all recovered, as did one after 10 milligrammes per kilogramme, although a control with this last dose died in 30—40 hours. In all the experiments of both series the recovered animals were alive and well five days and upwards after the injection of the venoms, which is two days longer than death has ever taken place in any of the control animals.

The above results are very encouraging as the viperine poisons are much less powerful, weight for weight, than are most of the Colubrines and Hydrophidæ, so that the amount of venom ejected by them can seldom, if ever, be more than two or three times a lethal dose for man

In the course of the experiments it was observed that, even when the incision was made only 30 seconds after the injection of the poison into the subcutaneous tissues, a distinct blood-stained effusion is found, which serves as a very useful guide to the location and limits of the injected poison, after 5 or 10 minutes the effusion is more extensive, and in these cases the incisions were prolonged up the limb for about 2 inches in order to try and destroy as much of the venom as possible. The fact that as favourable results have been obtained after 5 minutes as after ½ minute, may very possibly depend on the effusion noted materially checking the absorption of the poisons, so that at the end of that time the rate of absorption may become very much less rapid than during the first few seconds after its injection. That a very rapid absorption occurs during the first few seconds after the injection (probably on account of the action of the poison in preventing clotting of the blood locally) is certain, for it was shown by Fayrer many years ago that a dog bitten in the tail by a full-sized cobra died in spite of the tail being cut off between the bitten part and the body a few seconds after the bite. In such cases, however, the dose received is relatively much larger than could be injected by a cobra in the case of such a large animal as man, so that in practice (except in the very rare cases where the poison is injected directly into a vein), a fatal dose may not enter the system for some considerable time after the bite. This probability is supported by the fact that, in the case of Colubrine poisons at any rate, the minimal lethal dose is the same whether the venom is given subcutaneously or intravenously, yet it takes one or two days to produce death when injected under the skin, but only 5—20 minutes when inserted into a vein, so that under the former conditions the whole of the poison does not enter the circulation for a long period. These facts suggest the hope that the method of treatment here advocated may produce good results even when it is not put into operation until considerably longer periods than in any of the above experiments, especially when only slightly *supra* minimal lethal doses have been received into the tissues.

Conclusions.

Further experiments will be necessary to ascertain the exact limits of the value of this form of treatment, and they will be undertaken immediately by one of us (Rogers) in India, fresh venoms being tried, as it is possible that they may be more rapidly absorbed than those which have been dried and re-dissolved, we think, however, that the results reported in this communication are sufficiently promising to make it advisable to place them on record with a view to a trial being given to the method in suitable cases, especially as the crystals of permanganate of potash are actively antiseptic without acting as more than a superficial escharotic, so that the treatment has no markedly injurious effect which can be weighed for an instant against the terrible results of bites by venomous snakes. The process here recommended has already yielded experimental results far in advance of anything hitherto attained. It is worthy of note that the earlier experiments of the first two authors were stopped nearly 30 years ago by the passing of the Act for regulating experiments on animals in England, but for which this logical sequence of their earlier work might very probably have been made many years ago.

ADDENDUM BY LEONARD ROGERS.

ON my return to India an unexpected transfer from Calcutta prevented me carrying out my intention of extending considerably the experiments on the permanganate treatment done in London, and I have only yet been able to perform a few more with cobra venom. In these recoveries were obtained in cats with from 3½ lethal doses of cobra venom when the ligature and treatment was deferred for fifteen minutes, and from 2 lethal doses after half an hour. On the other hand, ten lethal doses proved fatal in spite of treatment after five minutes, so that it is clear that if the full dose of a cobra is received, the treatment will have to be very prompt to be effective, but that after smaller doses some delay need not prevent a successful result being obtained.

In order to be able to form some estimate of the number of lethal doses for adult men which are likely to be received from different snake bites, I have made some measurements of the amounts ejected on making them bite through a leaf and weighing the venom after drying it over sulphuric acid, as the time after infliction of the bites when the permanganate treatment is likely to be effective will depend on the amount of poison received and its toxicity. The most important point to settle here was the average amount of cobra venom ejected by a full-sized cobra, as different writers give widely divergent amounts. Thus Lamb quotes Calmette as giving the amount as from 30 to 45 milligrammes, and from this datum Lamb calculated that 40 c. c. of Calmette's serum would be sufficient to save the life of a man who had received the full amount a cobra ejects. He appears to have overlooked D. D. Cunningham's estimate of the amount in one of his well-known papers in the Scientific Memoirs of Indian Medical Officers, at 254 milligrammes on the average, which, according to my experiments in London with fresh serum kindly sent me by M. Calmette, would require 400 c. c. to neutralise it, even if mixed with the venom before injection. I have recently measured the amount of venom obtained from two full-sized cobras and found the average to be 249 milligrammes, so that, as might have been expected, D. D. Cunningham's observations, made in the home of the cobra, were quite correct, and Lamb's estimate of the amount of serum necessary is some ten times below the mark. Recently, I have also carried out some experiments to ascertain the relative value of antivenin made purely from cobra venom (kindly supplied me by Messrs. Burroughs and Wellcome) against cobra and hamadriad venoms, using the serum in three different ways. Firstly, by mixing both the serum and the venom at blood heat for half an hour before injection; secondly, by injecting each subcutaneously at different places at the same time; and, thirdly, by injecting the poison subcutaneously and the serum intravenously at as nearly as possible the same time. The results are of great interest and importance, as they showed in the case of both venoms the antivenin acted just about as well when injected intravenously at the same time that the venom was given subcutaneously as it did when mixed with the venom for half an hour before injection. On the other hand, the same amounts of serum had little or no action when injected subcutaneously in a separate part of the body to the site of injection of the venom. For example, 2 c. c. of the serum intravenously saved the life of a pigeon, into which four lethal doses of cobra venom was injected subcutaneously, but 6 c. c. of the same serum subcutaneously failed even to prolong the life of another pigeon which had received only two lethal doses of the venom separately from the serum. Moreover, 2 c. c. of the serum injected intravenously one hour after two lethal doses of the venom had been given subcutaneously, and had already produced marked symptoms at the time the serum was given, saved the life of the bird, a control dying in the usual time. The same dose, however, failed under these circumstances against three lethal doses. It is clear, then, that the usually issued directions, to the effect that antivenin should be injected subcutaneously unless symptoms have already set in, should be altered and the antivenin always injected intravenously, so as to obtain its maximum effect. Even then several hundred c. c. would be required if it is to be trusted alone against a full dose of cobra venom, as Lamb advises. If, however, most of the venom is destroyed by the local application of permanganate of potash, then smaller doses will suffice to neutralise the venom already absorbed before the local treatment is carried out, but the serum should be issued in much larger quantities than the 10 or 15 c. c bottles now sold.

My recent experiments, in which several lethal doses of hamadriad (king cobra) venom injected subcutaneously were completely neutralized, by antivenin, prepared solely from cobra venom, injected intravenously are also of great interest and importance both from the theoretical and the practical points of view. In the first place, they afford a complete answer to Lamb's recent criticisms (Scientific Memoirs, No. 10, New Series) of my former experiments, showing that relatively very large doses of Calmette's antivenin did actually neutralise ten lethal doses of hamadriad, krait and enhydrina venoms severally, on the ground that Calmette's antivenin is made by using more than one venom, namely, of the cobra and Russelli viper, for I have now obtained a similar neutralisation of hamadriad venom in the blood of the animals themselves by a serum made purely from cobra venom. Further, I have it from M. Calmette himself that no sea snake poisons were used in the preparation of his serum, for the very good reason that he had none to use, so that my success in neutralising enhydrina poison are beyond criticism on this ground, while I have recently obtained a similar neutralisation of this poison by antivenin made purely from cobra venom, as indeed Lamb himself has also done in one experiment given in his paper. I much regret also having to take exception to his criticism of my statements in two different papers with regard to the action of antivenin against enhydrina poison, with regard to which he remarks "it is difficult to reconcile these two statements, and as no details of the experiments performed are given in either instance, it is impossible to sift them critically, with a view to ascertain where the error lies." As a matter of fact, it was mentioned in the first paper that only ½ c. c. of serum was used; and after half hour at blood heat after being mixed with the venom, it was injected subcutaneously into rats, the only object of the experiment having been to ascertain if the serum had any action of a practically valuable nature; while in the second series, which were actually carried out months after the publication of the former (Lamb having unfortunately overlooked the note appended to the lecture, saying that much work done after its delivery was included in the published version) recoveries were only obtained when 6 and 7 c. c. of a fresh serum, which had not passed through a tropical voyage, were used, the object of the experiment being to find out if the serum had any action in large doses. It is unfortunate that Lamb did not await the publication of my full paper before incorrectly assuming an error on the part of a fellow worker, while a simple calculation from the data actually given in my lecture as to the amount of enhydrina venom 1 c. c. of the serum neutralised, the animals used in the experiments and the number of lethal doses injected, would have enabled him to approximately calculate the amount of serum I must have used and so have avoided his unfortunate remarks. With all these data I am at a loss to understand how he can have written that I gave no detail in either of the papers he refers to.

With regard to krait venom, the single experiment of Lamb with a mixture of 4 c. c. of cobra serum and 0·4 milligramme krait venom, with a negative result is of no value in proving that the serum has no action against that venom, as in the experiments, in which I obtained recoveries from ten lethal doses of krait venom mixed with Calmette's serum, I calculate that, allowing

for the differences of the strengths of the serum and of the venoms, the quantities of serum used in my successful experiments were five times as great as in Lamb's single experiment, so only a negative result was to be expected in his case Moreover, I have since carried out some further experiments on krait venom, using the serum made purely from cobra venom and have obtained very similar results to my previous ones, allowing for the differences in the strengths of the serum and venoms used in the two series

It is clear, then, that a serum made purely from cobra venom has some action on the three other colubrine venoms, the hamadriad, enhydrina and common krait, as I proved beyond doubt last year by obtaining recoveries after injecting ten lethal doses of each, previously mixed with antivenomous serum, and thus the serum is not strictly specific in its action as Lamb continues to try to maintain. That this action is too feeble to be of any practical use in the case of the serums yet obtainable, I pointed out in my lecture, but nevertheless the fact that it has some action is of importance from the utilitarian as well as from the theoretical standpoints, for if each venom when repeatedly injected into horses will fortify the action of their serum against the other Colubrine venoms, even to a small extent, then by immunising horses by the use of several different Colubrine venoms it should be possible to produce an antivenin of practical potency against all of them much more easily than if each is purely specific in its action. Attempts are being made at my suggestion in Europe to make such a serum against the Indian Colubrine snakes, which, although not likely to be strong enough to save life by itself, especially in view of the feebleness in practicable doses of the strongest cobra venom yet made, may still be of great practical value as an adjunct to the local treatment with permanganate of potash.

Lastly, I have made some measurements of the amount of venom obtainable from Russell's vipers and kraits. Two large specimens of the former yielded 223 and 175 milligrammes respectively, or an average of almost 200 milligrammes. As this venom is ten times as weak as cobra venom, I estimate this quantity as only from one to two lethal doses for a man, so that the permanganate treatment locally might be expected to be efficient, even when used some time after the infliction of the bite, as I obtained a recovery in a cat from two lethal doses when the treatment was not begun for fifteen minutes, while this time may very likely be extended by further work. In the case of the krait, I obtained 60 milligrammes from one very large specimen, and 11 and 10 respectively from two ordinary sized ones, and none at all from one small one, so that the amounts vary widely. I also find the lethal doses for different animals also varies more than with any other venom I have worked with, but it is certainly considerably stronger than cobra venom, so that this snake partly makes up for the smallness of the amount of venom it may eject by its greater virulence. It therefore appears probable that a full dose of venom from a large krait would be as deadly as that of a full sized cobra; but the smaller ones would be less deadly, and their bites may be effectively treated by the permanganate method even after some delay with good hope of success. I have shown elsewhere that the venom of the banded krait is many times less active than that of the cobra or common krait, so that the local treatment may also be expected to prove efficient against the bites of this snake even after some time has elapsed. Further data are required as to the amounts of venom ejected by different snakes, but from the above facts I think it may be said that the local treatment with permanganate of potash, as described above, may be expected to save the lives of persons bitten by other than large cobras and very large kraits if the treatment is carried out within from fifteen to thirty minutes, but in the case of the two mentioned, it would have to be begun very quickly to be certain to save life, as could be done if one of Sir Lauder Brunton's instruments was ready at hand, or antivenin also available in the case of the cobra.

OBSERVATIONS ON THE EFFECT OF THE INJECTION OF LEPROLIN.

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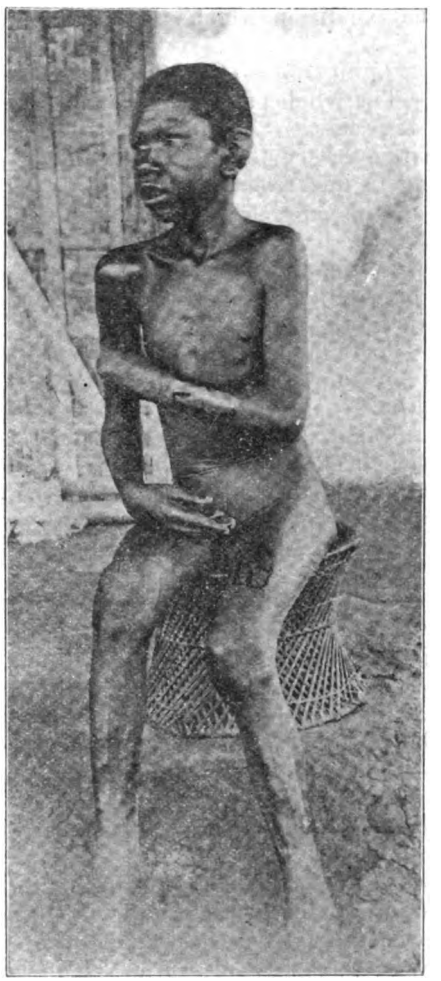
CASE No. I.

Name	...	Jadab Chandra Dey.
Sex	...	Male.
Age	...	About 16 years.
Date of admission into the Asylum	...	25th January 1902.
Duration of the disease when admitted	...	About 5 years.



Previous history of the disease.—He gives a history that his parents died of ordinary fever, dysentery, etc. He saw his mother who was a healthy female. He never heard of any such disease affecting any of his relatives either on the paternal or maternal side, and so there can be no trace of heredity. When he was a boy of eight, he was perfectly healthy and as he was an orphan, a Doctor Babu of Cachar took pity on him and engaged him on household work and grazing cattle outside. He thus

spent a year or two of his early life in Cachar with that family, and there was no leper in that family. Afterwards he went with that Babu to his house in Bikrampore in Dacca. In that village there lived an old female leper close to his house. The boy used to go to her house several times a day, but he, as he says, did not come in contact with her. After a stay of two years in that village, he returned to Cachar and within a period of a year and a half he first noticed that a small area of skin in the middle of the front of the thigh was less sensitive, which went on extending and increasing in degree. Within three months after the appearance of the anæsthetic patch in the thigh he noticed the skin of both the forearms on their extensor surfaces sharing the same anæsthesia. That area gradually extended and developed, and has now assumed the present condition, which is described in detail below.

Present Condition.—(On 30th May 1904).

Ears.—The whole of the external structures of both the ears are nodulated. The lobules of the ears are very much broader and thicker, measuring 1¼ inch from side to side. Along the margins of the ear there are four big nodules on the right and six on the left ear. They are elongated and separated from each other by small creases or slight transverse depressions. No anæsthetic spot.

Face.—There are four small tubercles on the forehead and four on the chin. They are not very distinctly marked, but gradually merge into the normal skin. Some elevations in the skin of the cheeks. Alæ of the nose are much thickened. The thickened and nodulated skin of the tip of the nose threatens to proceed to ulceration. No anæsthetic patches on the face.

Hands.—All the fingers and backs of the palms are very swollen and thickened, the right hand being more marked than the left.

Forearm.—An anæsthetic patch on the left forearm at the middle of its extensor surface 2½ inches above the wrist, measuring 3¾″ × 1¾″.

Chest.—One small but prominent tubercle situated ½ inch away from the right nipple. No other tubercles and no anæsthetic patches on the chest or abdomen.

Left thigh.—No tubercles on the left thigh. An anæsthetic patch in the middle of the anterior aspect of thigh 3 inches above the upper margin of patella. It measures 3¾ inches in length and 2¼ inches in breadth.

Right thigh.—No anæsthetic patches or nodules.

Left foot.—The boy says that during hot days he experiences anæsthesia and burning sensation in the feet and return of sensation in the same area at night and on rainy days when the weather gets comparatively cooler. The tips and sides of the little and fourth toes are ulcerated. Both sides of the heel are very much thickened.

Right leg.—Two small tubercles at the lower third of the front of leg 3 inches apart from each other, the lower one ½ inch above the outer condyle of ankle. No anæsthetic area.

Right foot.—The sides of the third and fourth toes and the corresponding intervals are ulcerated. The foot retains its normal sensation. The sides of the heel are very much thickened.

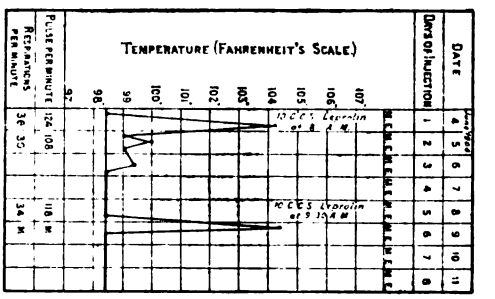
Buttocks.—Seven prominent but small tubercles on the right buttock and upper and back part of thigh. No anæsthetic patches.

Since his admission into the asylum he was treated with all the prescriptions and formulæ that are ordinarily given to lepers, *i.e.*, chaulmugra oil, gurjan oil, emulsion, arsenic, iodides, &c, and various ointments for external application. All these had little effect in checking the usual course of the disease.

1st June 1904.—The boy was prepared for an injection of leprolin. His bowels were cleared and he was given an ounce of common salt (table salt) dissolved in water in divided doses four times a day and salt ointment was rubbed all over the body, especially into the anæsthetic areas.

4th June 1904.—On the morning of 4th June 1904 a photograph of the boy was taken after distinctly marking the anæsthetic patches with tar (*vide* photograph).

At 9 A.M., he was injected with 10 c.c. of leprolin intra-muscularly in the right buttock. Shortly after the injection he felt hot and light all over the body and experienced a peculiar unpleasant sensation which he can't express in words. He had nausea; the temperature was very carefully registered every two hours. It is shown below. The right buttock around the site of injection was red, hot, swollen and painful. He was given rice and milk with sugar as diet. No redness or inflammation of the anæsthetic patches noticed. Salt mixture and salt ointment were given.



The temperature of 4th June, the day of injection—

At 10	A.M.	..	...	... 99·4° F.
,, 12	A.M.	...	...	... 99·8° F.
,, 2	P.M.	...	...	... 104·2° F.
,, 4-15	P.M.	...	...	... 102·8° F.
,, 6	P.M.	...	...	... 101·8° F.
,, 9	P.M.	...	...	... 101·2° F.

Pulse at the height of fever ... 124 per minute, and
Respiration .. ... 36 per minute.

5th June 1904.—The temperature has been coming down very slowly as the following notes

will show. The patient feels a little better than yesterday. The inflammatory swelling of the right buttock is a little more than yesterday. There is a return of sensation in the skin of the anæsthetic patches of left forearm and left thigh. The tubercles on the right buttock and thigh are flattened this morning. Complains of headache and nausea. No inflammation or redness of anæsthetic patches noticed. Bowels not moved. Salt ointment and salt mixture given as before.

Temperature of 5th June 1904.

At 6-30 A.M.	... ...	... 99° F.
„ 9 A.M.	... ..	... 99·8° F.
„ 12 A.M.	.. ..	... 99·4° F.
„ 3 P.M.	.. ...	... 99·6° F.
„ 6 P.M.	... .	... 99·4° F.
Pulse at 8 A.M.	...	... 108 per minute, and
Respiration	...	.. 30 „ „

6th June 1904.—The temperature came down to normal early in the morning. Bowels cleared. Slept at night. The buttock swollen and painful as yesterday. The regained sensation in the anæsthetic patches is the same as yesterday. To-day it was noticed that there was distinct sinking and flattening of the nodules in the body, especially near the site of injection and on the chest. There is no marked change noticed in the nodules of the ear and nose and no change in the ulcerations present in the lower extremeties. The patient to-day told me that this is the first time that sensation has returned in the parts for years. He says that the disease began with these anæsthetic patches, the thigh patch shown in the photograph appearing first.

7th June 1904.—The temperature is normal from yesterday morning. He feels lighter than yesterday. Sensation in the anæsthetic patches is better than yesterday, but there is no change of colour or inflammation. The pain and swelling of the right buttock around the injection are less than yesterday. Distinct sinking of the tubercles and wrinkling of the skin over them. Bowels not moved this morning. Tongue coated, but appetite good. Salt given internally and externally as before, and the ulcers of the foot dressed with boracic ointment.

8th June 1904.—The temperature is normal. Bowels moved. Appetite better. Slept well at night. There is a return of sensation in the anæsthetic patches as noticed on the second day of injection, but they are a little less sensitive than the normal skin of the surrounding parts. The pain and swelling of the right buttock less than yesterday. It was noticed to-day that the ulcerations in the toes, which shewed chronicity previous to the injection, are beginning to show reaction, and healthy granulations with a tendency to bleed are appearing. The tubercles appear to be flattening and absorbing, but no marked changes have been observed in the nodules of the ears. Previous to the injection the boy, who is intelligent, says that at night the pain used to increase, but now the pain is better and he feels lighter in his body. This morning at 9-30 A.M., an injection of a little less than 10 c.c., of leprolin were injected into the glutial muscles of the left buttock.

There was no rise of temperature for about five hours after the injection, but at 2 P.M., the temperature began to rise, and within half an hour it reached 104·4° F. and, gradually subsiding, came down to 99° F. at 9 in the night, and this morning it fell to normal. The uneasy sensations and giddiness experienced after the injection was of a less severe nature than after the first injection.

Temperature of 8th June 1904—*the day of second injection.*

At 6 A.M.	... Normal	Before injection.
„ 9 A.M.	... Normal	
„ 12 A.M.	... Normal.	
„ 3 P.M.	... 104·4° F.	
„ 6 P.M.	... 99·4° F.	
„ 9 P.M.	... 99° F.	
Pulse at 3 P.M.	... 118 per minute, and	
Respiration	... 34 „ „	

9th June 1904.—This morning he feels better. There is a marked change in the tubercles of the chin, left forearm, thigh and face. The skin over these tubercles showing distinct shrinking. The ulcer of the left foot looks better. The site of injection is red, hot and swollen. The anæsthetic patches are same as yesterday. There was no change in the colour of the anæsthetic patches. The general appearance of the boy looks brighter and better than before injection. The swelling of the hands appears to be somewhat less to-day. The nodules about the alae of the nose do not seem to be so "raspberry" like in appearance, but are smoothing down. The nodule above the right nipple has almost completely disappeared.

Temperature.—Normal.

10th June 1904.—No change from yesterday. He feels better and brighter. The swelling and pain less in the buttock at the site of injection.

Temperature—Normal.

11th June, 1904:—Pain and swelling in the buttock less. Nodules on the nose and chin are disappearing. Ulcers of the foot are better looking.

Temperature;—Normal.

12th June 1904.—Doing much better. The ulcers look healthy and no discharge from them. The pain at the site of the injection is much less. The anæsthetic patches are the same as yesterday. Some of the tubercles are reduced in size. There is marked change in the nose and chin.

Temperature.—Normal.

13th June 1904.—There is no marked change to-day in the anæsthetic patches and in the ulcers. Bowels regular. Slept well at night. Appetite good.

Temperature—Normal.

14th June 1904.—The ulcers at the toes are healing up from the circumference and looking better. No discharge from them and no pain. The nodules at the back of the right thigh are also smoothing down. Pain much less at the

sites of injections. There is a marked improvement in the ulcers in the toes and the fingers of the patient. The thickenings near the alae of the nose and on the chin look less red and the ears are less swollen, specially the left one. As the disease is in an advanced stage it is proposed to inject 10 c.c. into the scapular muscles, so as to act more specially on the lesions of the face. I also noticed to-day that the feet are less swollen indicated by a wrinkling of the skin.

Temperature.—Normal.

(*To be continued.*)

AN OUTBREAK OF PLAGUE AT ARRAH IN 1902-1903.

BY R. K. GUPTA, L.M.S., M.R.A.S. (LONDON),

Assistant-Surgeon, Arrah.

THE plague broke out in December 1902, at Arrah and lasted till the end of May 1903, during which period there were 2,017 attacks in the town, of these only 167 cases came under my treatment.

Period of incubation varied between a few hours and two weeks from the time of exposure to infection.

Symptoms.—There is mental depression, giddiness, pain in the limbs, dull and throbbing pains in the groins, axilla or neck, the seat of future buboes.

The disease sets in with strong headache, rigor accompanied by fever, aching of the limbs, drousiness; the eyes are blood-shot, sunken and staring and he staggers like a drunken man. The skin dry and burning; there is great thirst, violent prostration, tongue swollen and covered with fur; border indented and reddish. There is difficulty in speech.

In most cases delirium sets in, there is sordes on teeth, the pulse at first full, gradually loses tone and becomes intermittent. The heart becomes dilated and very weak, and death generally ensues from failure of heart; in many cases at the time when the patients exert to get up and walk about in state of delerium.

Neck.		Axilla.		Groin.		Pneumonic variety.	No buboes.	Total.	Result.		Percentage of cures.
									Cured.	Died.	
Right.	Left.	Right.	Left.	Right.	Left.						
6	7	26	11	59	39	8	11	167	55	112	33 p.c.

The buboes generally appeared between two to four days from the date of attack and in some instances the appearance of buboes and fever was simultaneous.

The above statement will show the different sites of buboes in 167 cases under my treatment and the percentage of cures.

In one case the bubo appeared at about the middle of left forearm anteriorly, and in another case at about the middle of thigh externally

Prognosis—The pneumonic variety of plague is generally fatal, the next in severity is the plague with buboes in the neck. The plague with buboes in groins and axilla are more favourable.

Much, however, appeared to depend on the hygienic condition of patient, attention and proper nursing and the state of health.

The favourable sites—In groins, the common site is about 1½ inches below the inguinal region, in the axilla about 1 inch below the angle of armpit and in the neck at about the middle on the outer border of sterno-mastoid muscles. In one case the gland appeared about 1 inch above the left nipple.

History of disease.—At the commencement of outbreak the disease was virulent in its attack. In one family, goldsmith by caste, five persons slept in a room in the night, complaining of slight fever. In the morning four men were found dead. Five more members of the same house got next attacked and they placed themselves under my treatment, of which two died and four were cured.

In the Arrah Jail there were eight attacks, within a period of one week, of whom five were cured and three died.

The first case was in a prisoner, who was engaged in sweeping the inside of jail; two cases occurred among the prisoners, who were engaged in cleaning the godown where dead rats were found. In the jail where proper treatment and nursing could be adopted, the percentage of cures was very satisfactory.

Conditions favouring plague.—Moderate temperature combined with dampness is the chief atmospheric condition favouring growth of plague germs. The most favourable season appears to be in this part of the country between January to April.

Extreme filth and overcrowding are also the principal causes which predispose epidemic outbreak—as is evident from the fact that the disease generally commenced in the most insanitary and crowded bustee of the town. In consideration therefore of the wretched hygienic conditions of the town, ill-ventilated dwelling-houses, coupled with the poverty of the people, it is not impossible to prognosticate that plague will continue epidemic for many years to come in this part. All measures to stamp out the disease will bear no fruit unless the people will co-operate with the authorities and begin to improve the hygienic conditions of themselves and their surroundings.

The spread of plague is peculiar. Particular houses may be infected while those in the neighbourhood are free. It spreads very slowly from

house to house and from one bustee to another, depending more on place infections than by transmissions from person to person.

Influence of age and sex.—The children and adults are susceptible. Women are more liable than males on account of their remaining much indoors in filthy surroundings.

Disinfection and dessication.—Neither the disinfection or the dessication produced the desired effect—probably for two reasons (1) There was no properly trained disinfecting staff. The disinfection, as far as I am aware, meant only sprinkling of some perchloride lotion either on the floor of the house or on the walls as far as the hands could reach. The dessication was also done more or less in the same perfunctory way. I do believe if the dessication and disinfection had been properly done, the disease could not have caused such havoc every year, and those methods also would not have been unpopular. For instance, I may mention here during the outbreak of plague in Arrah Jail in 1903, the wards and godowns were thoroughly disinfected under my direct supervision every day while plague lasted in the town, with the result that attacks ceased immediately, and though this year there was plague in the vicinity the jail was free.

I. In the town, the houses where the plague cases occurred or rats died, during the first outbreak in 1901, were invariably first infected, showing that the soil had not been free from plague germs, but they remained in dormant state.

II. There are low ill-ventitated houses, into the interior chamber of which air and light never penetrate. They afford dark holes for the reception and growth of infection. The houses and rooms that were disinfected and dessicated were reinfected either by a new tenant or by old infected material where no disinfection could reach, thus the same houses or locality serve as hot-beds where the disease first breaks out under favourable conditions.

Evacuation of houses, as soon as the locality is infected, proved a success to check the outbreak for the time being, and the people have great confidence in it and they resort to this method of their own accord. It is regretable that often they carried with them old rags or other infected materials and not infrequently the disease made its appearance in this new abodes.

The infection is found to have been carried through cloth and beddings and ornaments. A goldsmith of this place secured a nose ornament from a woman who died of plague and presented it to his mistress. who wore it and got attacked with plague on the third day and died of it.

Breath of the plague patient is dangerous and one should always be careful in nursing and not to hang over for a long time. Excreta of the patients are also equally dangerous.

Prophylactic measures.—(1) The dwelling-houses should be well ventilated admitting air and light; the surroundings of houses, adjoining drains and cesspools should be kept clean and washed daily with disinfectants.

2. The bedding and clothing should be warmed in sun daily if possible.

3. Bathing with hot water, previously anointing the body with soap or mustard oil, is preferable.

4. The floor of the houses should be a *pucca* one and well cemented, and living in upper story is advisable.

5. All the rooms of the house should be dessicated at least twice a week during plague time.

6. One with open sores on the body, especially on the feet, should not be exposed to plague poison.

7. Every one should use shoes during the plague season.

8. A pill containing—

℞.

Quinine Sulph.	...	...	gr. i
Acid Carbolic	...	...	„ ½
Musk ...	...	...	„ ½
Pulv. Ipecac ..	...	...	„ ½
Ext. Nux Vomica	...	...	„ ½
	Pill	...	i

two or three times a week had been of much use, and largely tried among the prisoners in Arrah Jail during the epidemic of 1903.

Treatment.—(1) Purgative, (2) stimulant, (3) absolute rest and counter irritant to enlarged gland are the chief factors.

Purgative.—Hydrarg Subchloride with phenacetin till the bowel is freely opened.

The following mixture proved highly efficacious:—

℞.

Liqr. Ammon Acet.	...	...	℥ i
Spt. Ammon Aromat	...	...	m. x
„ Chloroform	...	...	„ x
Tinct. Moschi	...	...	„ x
„ Digitalis	...	...	„ v
„ Iodine	...	...	„ iv
Aquae ad. ...	...	...	℥i

Mix. One dose to be repeated every three hours.

In cases attended with violent prostration pure musk gr. 1 with honey was given three or four times a day, and the following micture was administered:—

℞.

Spt. Ammon Aromat	...	...	m. xx
Liqr. Strychnine	...	...	„ iv
Tinct. Digitalis	...	...	„ v
Spt. Chloroform	...	...	„ x
Aqua ad. ...	...	...	℥i

Mix. One dose every three hours.

When delirium supervened, a draught with Potassium bromide and Tincture of hyocyamus had been of much use.

In cases where bubo appeared—application of Emplastrum Hydrarg Ammoniacum or Hydrarg oleate produced marvellous effect.

Absolute rest.—Under no circumstances should the patient be allowed to get out of bed and to exert himself in any way. He is to lie perfectly quiet. Cases are not rare where patient died of failure of heart after getting up in a state of delirium.

Diet.—The food should be nutritious and liquid, preferably milk or milk with brandy, essence of chicken or barley.

A Mirror of Hospital Practice.

CASE OF LARGE NÆVUS—EXCISION: RECOVERY.

BY F. A. L. HAMMOND,

CAPT., I.M.S.,

Rangoon.

THE most striking feature of the case shown in the annexed photographs is that this Burmese woman Ma Min Kin waited till she was 50 years of age before making any attempts to get the disfigurement removed. She was admitted into the General Hospital, Rangoon, on 11th July, 1903, in the condition shown in Photo I. She

stated that the tumour had been there since birth, that it had grown steadily with her own growth, and that at the time of her marriage, 26 years ago, it had increased considerably in size, since when it had remained stationary. No alteration or diminution in the size of the tumour had been noticed at the menopause, which occurred three years previously to her coming to hospital. Her general health was very good.

On admission the swelling was found to be a true non-malignant angioma pedunculated in parts, with large venous sinuses, involving the entire left side of the lower lip and extending downwards over the skin covering the left anterior triangle (Photo II). The whole thickness of the lip was involved except the mucous membrane, which presented an ulcerated surface

due to the two lower central incisor teeth which had been driven inwards by the pressure. There was also a small nævus growth, the size of a shilling, on the left half of the tongue.

The teeth causing the ulceration were extracted under cocaine, the mouth was washed out frequently with Condy's fluid, and the ulcers were dressed with carbolic gauze (1 in 60) covered by protective oil silk. On the 21st July, under chloroform, the portion involving the skin of the neck was first dissected out, the skin was sutured and a collodion scab applied; the part involving the lip was then cut away freely, the pedunculated portions being first transfixed with harelip pins and ligatured to arrest hæmorrhage as far as possible. Bleeding was very profuse and was checked partly by ligatures, but mainly by Pacquelin's Cautery. Owing to the amount of blood lost it was decided to leave a few very small outlying portions of the nævus for some subsequent occasion. Those were removed on 28th August by Capt. Rost, I.M.S, while I was away on leave.

The wound was dressed with carbolic gauze soaked in 1 in 60 carbolic lotion. An oil silk covering was tightly stretched across the whole of the lower lip, but it was found impossible to prevent fouling of the dressings with saliva, more especially as the patient could not be persuaded to desist from smoking large Burma cheroots and chewing betel. In spite of these disadvantages the wound granulated in a very healthy manner, without suppuration. There was no fever or shock following the operation.

Photo II shows the present condition of the patient. There is considerable scarring

but the patient is very pleased with the cosmetic result, which is on the whole very satisfactory.

THE EFFECT OF CREOSOTE RUBBING UPON HIGH TEMPERATURE IN REMITTENT FEVER.*

BY PREMANANDA DAS,

ASSISTANT-SURGEON,

Arambagh, Hughli District.

NANI, Hindu child, aged 6, got fever on 3rd January 1904. Bowels constipated, splenic border could be felt just below the costal arch; all other organs normal. The fever was of double quotidian type; there were regular double proxysms every day. The temperature recorded at 6 A.M. and 6 P.M. varied between 101°F. and 102°F., and that at 12 noon and 12 midnight between 104°F. and 105°F. He was given an initial purgative; diaphoretics combined with carbolic acid, arsenic, taraxacum, eucalyptus were administered and were continued till 11th January.

Ice was applied to the head, but the administration of all these drugs did not in any way influence the temperature. A dose of santonin and castor oil was given, but with no effect. On the 11th January phenacetin was given with caffein citras and brandy. Ice to head was continued. After two doses of phenacetin the temperature came down to normal. He had been taking quinine regularly. There was no relapse until 19th February, when he got fever again, and the temperature recorded exhibited the typical double paroxysmal character. Diaphoretics, arsenic, carbolic acid, &c., had no effect.

On the 29th February, one dose of phenacetin was given, and was repeated, but the temperature did not come down below 102°F—. It rose again to 105°F. on 1st March 1904, when creosote one drachm mixed with two drachms of olive oil was ordered to be rubbed over the abdomen of the child. I sat by the side of the patient to watch the effect. After twenty minutes' rubbing, I saw beads of perspiration appearing upon the forehead of the child; he perspired freely, and his temperature in half an hour fell to 100°F. I stopped all medicines, and gave creosote rubbing every day (from 1st to 4th March). The temperature exhibited a much milder double paroxysmal character, *viz.*, at 6 A.M. and 6 P.M. 100°F., and at 12 noon and 12 midnight 101°F., until on the fourth day it came down to normal, when quinine was given. He has been getting no rise of temperature since then and has been convalescing.

Tanu, Hindu child, aged 8, elder brother of the former child, got fever on 17th March 1904. His temperature displayed exactly the same double paroxysmal character as in the former case, spleen border below costal arch, liver congested and tender; an initial purgative, calomel followed by salines, was administered. Diaphoretics combined with carbolic acid, arsenic, taraxacum, eucalyptus were given and were continued on till 27th March 1904. The administration of these drugs did not in any way influence the temperature.

On the 27th March phenacetin was given, and the temperature came down to normal. This was followed by the administration of twenty grains of quinine in divided doses, but the temperature rose again on 28th March, and began to exhibit its typical double paroxysmal character. From 28th March to 1st April inclusive, diaphoretics combined with carbolic acid, &c., were continued, but with no effects.

On 2nd April creosote rubbing was ordered, temperature 105°F. I sat by the side of the patient, temperature came down to normal in half an hour and never rose again; he has been getting quinine since then and has been convalescing.

Remarks. — The record of these two cases shows the effect of creosote rubbing upon high temperature, which did not appear to be amenable to any sort of treatment by drugs. The influence of all other factors was eliminated, and the lowering of temperature in half an hour, after its administration, could not certainly be attributed to any other influence.

The following points have been observed by me:—

1. The temperature is lowered in half an hour, sometimes to normal, sometimes to a little above normal.

2. The effect of creosote rubbing appears to be more lasting in its effects than phenacetin, thus affording sufficient time for vigorous administration of quinine to cope with the parasites.

3. If after creosote rubbing temperature comes down to 100°F. but not below that, the rubbing requires to be repeated. As much as half a drachm of creosote at one time and half a drachm of olive oil has been rubbed daily over the abdomen of a child six years old, without the development of any poisonous symptoms.

4. If in the course of repeated rubbing, symptoms of stupor or pain during micturition develop, the exhibition of the drug should be stopped.

The use of creosote rubbing for high temperature was suggested to me by Mr. Knight, the Assistant Superintendent, Calcutta Medical College Hospital.

* Forwarded by Lieutenant-Colonel D. G. Crawford, I.M.S., Civil Surgeon of Hughli.

A UNIQUE CASE OF INTESTINAL OBSTRUCTION.*

BY CAPTAIN A. W. COOK YOUNG, I.M.S.,

M.B., B.Ch., D.P.H.;

LIEUT. G. I. DAVYS, I.M.S.,

B.A., M.B., B.Ch., B.A.O.,

Tibet Mission Force.

THIS case of intestinal obstruction occurred at Tuna in Tibet, and the facts relating to it are as follows:—

On April 11th 1904, M. L. (a Hindu, aged about 40), a commisariat agent, rode out to Guru from Tuna, a distance of ten miles, he was quite well when he arrived at Guru, and he did his work there, but during the course of the ride back to Tuna, he was seized with a sudden violent pain in his abdomen.

He got back to Tuna about 5.P.M., when he was seen by the Native Hospital Assistant on duty, who gave him a dose of castor oil, and later, about 8.P.M., an enema. Neither of these measures had any effect, nor did they relieve the pain. Early next morning, as the pain had become much more severe, the Hospital Assistant sent for Captain Cook Young, I.M.S., who found the patient's condition to be as follows:

The agent was lying on his back, his breathing was rapid and shallow, his abdomen much distended, hard, and tense. He complained of great pain, which was increased on pressure, and was not definitely localized to any particular part of the abdomen. No motion or flatus had been passed since the previous afternoon.

The patient's pulse was extremely weak, and he had a marked double aortic murmur; also the heart sounds in the mitral area were impure, even though no definite bruit could be located.

Captain Cook Young decided that it was a case of intestinal obstruction and called in Lieut. Davys, I.M.S., in consultation.

After a minute examination Lieut. Davys agreed to the diagnosis of obstruction.

A soap and turpentine enema was given, but no flatus or motion was passed, but a few minutes later the patient vomited twice, the second vomit consisting almost entirely of bile.

An immediate operation having been decided on, the patient was prepared, and at 11 A.M., Capt. Cook Young administered chloroform, Lieut. Davys undertaking the operation.

An incision was made about 4 ins. long in the median line above the umbilicus, as this seemed to be the point where the pain was possibly most intense.

The small intestine was found to be very full of gas, while the large intestine was collapsed and empty.

A small incision was made in the gut and the gas drawn off; a search was then made for the obstruction, and a small intussusception was found about 12 ins. above the ileo-cæcal valve; this gave some trouble, as reduction was rendered difficult by what appeared to be a solid lump in the middle of the enclosed gut. However, Lieut. Davys managed to draw the gut out; it was dark claret coloured, but soon began to recover. The lump which had been originally felt was now quite distinct, and it did not quite fill the lumen of the freed gut, though when the gut was enclosed the lump was firmly impacted. It felt on manipulation like a bundle of very thick whipcord, and was about the size of a very small pigeon's egg. It was pushed up the gut to where the small opening had been already made; this opening was enlarged, and the mass was then found to consist of a closely knotted bundle of round worms (ascaris lumbricoides) 10 in number, some of them being very small. These were removed, and the gut sutured up.

The toilet of the peritoneum was then performed and the abdominal wound closed.

The patient recovered rapidly and passed flatus three hours after the operation. He had a very easy night and complained of no pain.

He did extremely well until the second day, when while taking a drink he suddenly died of heart failure.

Post-mortem.—The wounds of both the gut and the abdominal wall were healing perfectly, and the peritoneum was healthy, the abdomen was otherwise restored to its normal condition. No examination of the heart was made, as a complete *post-mortem* was not thought advisable as the patient's friends might have objected.

The interest of the case lies in the extraordinary nature of the obstruction. Neither of the medical officers concerned were able to recall hearing of an exactly similar case, namely, intussusception of the small gut alone, complicated by a plug of round-worms.

It was most disappointing that the patient should die of heart failure, especially after the operation had been so successful. However the patient's heart was always very weak, and he took chloroform extremely badly. It was on account of this cardiac trouble that Capt. Cook Young administered the anæsthetic himself instead of assisting Lieut. Davys to operate.

No enquiry after the operation was able to elicit any history of round-worms from the patient, who was an educated man and always gave intelligent and clear replies.

* We are indebted to Lieut.-Colonel L. A. Waddell, I.M.S., C.I.E., P.M.O., of the Tibet Mission Force, for the publication of the articles by Medical Officers of the Mission.—ED., *I.M.G.*

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PATENT FOODS.

DR. ROBERT HUTCHISON of the Great Ormond Street Hospital for sick children had done a public service in reprinting his lectures on Patent Food and Patent Medicines,* which many of our readers will remember to have read in the home medical papers last year.

Dr. Hutchison is well known as the author of perhaps the best book in English on dietetics, so that the subject is one of which he is a master. He begins by asking what do we mean by a "patent" food, and gives the practical definition that "a patent food is a substance which is manufactured by artificial means from natural food products, and which is intended to be used as a substitute for ordinary natural foods."

Unfortunately we medical men know well that these foods though so assiduously advertised as to seem indispensable in the sick-room are often found wanting, and we also know that they are by no means cheap. Dr. Hutchison proceeds to discuss the defects of artificial foods. Their first qualification should be the power of stimulating appetite, and he concludes that with the exception of the fact that a meat extract can bring about a powerful secretion of gastric juice no patent food can be said to successfully compete in the promotion of appetite with skilful sick-room cooking. Nor does the writer believe that any artificial food is more easily swallowed or chewed than such natural foods as milk or prepared gruels. Nor, as regards compactness, are any of them superior. As regards the question of digestibility, it is often contended that because they are often "predigested" they are more easily digested than natural foods. Dr. Hutchison considers that the necessity for peptonising foods is greatly exaggerated, for "there are very few conditions of the stomach and intestines in which digestion of the food constituents is not carried on quite well;" the digestive glands act at low pressure, and "if food escapes from the stomach, it will almost certainly be satisfactorily dealt with in the duodenum or in the small intestine." "So that the mere fact that the stomach has struck work does not constitute a necessity for artificial predigested foods, unless the motor power of the stomach is also deficient."

Our author then goes on to classify patent foods as follows: —

i.—*Foods intended to supply special nutritive constituents* (α) proteid foods; (1) derived from meat; (2) derived from milk; (3) derived from vegetable sources; (4) derived from mixed sources.

(β) Carbohydrate foods, *e.g.*, malt extracts.

(γ) Fatty foods, as cod liver oil emulsion, petroleum emulsion or pancreatic emulsion.

(δ) Mixed fatty and carbohydrate foods, as virol, virvis.

ii. Beef extracts.

iii. Beef juices.

iv. Peptonised food, solid and liquid.

v. Infant foods.

In the first group, those which are intended to supply an extra quantity of proteid, he specially mentions as good or useful, Brand's nutrient powder, and Leube-Rosenthal's solution. The latter is a partially digested meat in the form of a sludge; it is extremely easily digested, and our author believes it to be "quite a good preparation."

As regards the foods derived for milk. This is a large group in which casein, the proteid of milk, has been separated out, and they are intended to be added to other foods to increase their richness in proteid, such are Nutrose (sodium-casein), Eucasin (ammonia-casein), Proteng, Plasmon, and Casumen. These are "among the most useful of the artificial foods which have been introduced," and they have the advantage of being relatively cheap.

Aleurone, a proteid of wheat is colourless, odourless, tasteless and fairly soluble, but it has never "caught on."

Tropon, derived from waste animal and vegetable substances is also rich in proteid, but has not come largely into use.

The next group to be considered are those foods which are intended to supply carbohydrates; these contain roughly the following proportions, sugar, 50 to 55 per cent.; soluble starch 10 to 15 per cent.; proteids 5 or 6 per cent.; and ash 1 to 2 per cent. These *malt extracts*, as they are called, are largely used. They were orginally made because they contained diastase, and it

* Patent Foods and Medicines by Robert Hutchison, M.D., London; John Bale Sons and Daniellson, Ld., 1904. Price 1s.

was hoped they would help the digestion of other starchy foods by converting them into sugar. They are necessarily expensive, and if the physician wants to give his patient diastase let him prescribe malt extracts, but if he merely wants to give sugar, let him give, not a partially digested sugar but a wholly digested sugar, like honey, at one quarter the price. Dr. Hutchison puts in a good word for Lactose or sugar of milk, one of the best means of enriching a diet in carbohydrates. Lactose is a food and does not taste sweet, and you can by adding lactose increase the food value of milk, without adding to the bulk.

We now pass to the third group, those which are intended to supply us with fat. It is not easy to see why these are prescribed, if one only wants an easily digested fat, there are, ready at hand, cream and butter. Dr. Hutchison considers petroleum emulsion a delusion, a mineral oil or hydrocarbon, like petroleum, could not, by any chance, be absorbed into the body. As long as we have butter Dr. Hutchison does not see the advantage of manufacturing pancreatic emulsion. Next are discussed beef extracts. In the ordinary sense they are of very little food value, they contain hardly any proteid and are chiefly extractives and mineral matters. They increase the desire for other food, so their proper place is the kitchen, not the sick-room. Take the world-wide known Bovril. A teaspoonful of Bovril, enough to make a breakfast cup of hot Bovril, is just equivalent to an ordinary piece of lean meat half a cubic inch in size (eight grammes.)

Next for the beef juices: these contain the fluid proteid of meat in an uncoagulated form; one of the best is Brand's Meat Juice. Valentine's is expensive and less in nutritive value than the others, Bovinine is said to be blood preserved in glycerine. Practically meat juices and meat extracts are not food because you cannot take enough of them.

Dr. Hutchison next has something to say about infant foods; their number is so great that no wonder people get confused as to their merits. They may, however, be classified in three groups, first of all those which are intended to be complete substitutes for human milk, such as the well-known Allenbury foods, Horlick's, Cornick's and Nestle's. They are practically desiccated milk. Our author concludes that it is possible to rear healthy children upon them, but they are apt to be deficient in fat, and after the first few months of use some fresh fruit juice must be added or the child will get scurvy. They are, however, vastly more expensive than either fresh or even condensed milk. The second class are those in which the starch is supposed to have been altered by the action of a ferment; theyare supposed to contain no starch, or the starch undergoes conversion in preparation for use into dextrine and sugar. Mellin's food contains no starch at all, and it is practically desiccated milk extract. It is as good as any of this class, but it is intended to be used in addition to milk, and it is certainly deficient in fat.

In conclusion we can heartily commend this little pamphlet to medical men practising in India. Its thoughtful perusal will well repay the small cost of the little book.

TESTING OF THE VISION OF NATIVE SOLDIERS.

THE following extract from a letter by Capt. N. P. O'Gorman Lalor, I.M.S., to the Principal Medical Officer, Burma, is here published on account of its special interest. It is apparent that Capt. Lalor has taken great pains to provide a satisfactory test not only of vision but to some extent of the intelligence of the sepoy-recruit. We are, at present not convinced that these test figures are superior to Landolt's optotypes for the illiterate. We invite the opinions of our readers. It may be remembered that we pointed out the inferiority of the "test dots" in an editorial in our issue for April 1902, p. 141 :—

I have the honor to submit the following opinion :—

In the first place, as far as the native army is concerned, there is, at all times, little difficulty in getting sufficient recruits. In the second place, natives of this country, as they lead a more primitive from of existence than Europeans do, are blessed with much better average vision.

With such material to choose from it is feasible to insist that all recruits not possessed of full normal vision shall be rejected.

Full normal vision would be represented by ability, on the part of a recruit, to read Snellen's Test Type D=6, at six metres.

The question then resolves itself into the choice of a visual test equivalent to Snellen's Test D=6, read at six metres. This test should be :—

1. Simple and applicable to the illiterate.
2. Portable, and therefore small.
3. Each figure at the prescribed distance should subtend a visual angle of 5.

4. The figures should vary in shape, and the figure detail at the prescribed distance should subtend a visual angle of 1'.

Capt. C. H. Watson, I.M.S, in his letter No. 509 dated 8th October 1903, to the P. M. O., Derajat District, objects to the Army Test dots, I. A. F. 1107, Medical, on grounds which I thoroughly endorse.

In a report last year on the subject of "A Scheme for testing the Eyesight of all British Soldiers" I expressed myself in favour of the Army Test dots provided :—

(*a*) That some were made square, and others round and the recruit under examination asked to state, not only the number, but also the shape of those seen.

(*b*) That the prescribed distance be 11·5 instead of 10 ft. I arrived at 11·5 ft. as approximately the distance at which the square enclosing each army test dot subtends a visual angle of 5' (to be strictly accurate the distance should be 11·811 ft.).

Captain Watson's contention about the effect of luminosity in shewing up the test dots is certainly true if all the dots be of the same shape It would be equally true of Snellen's types if all consisted of one letter (say a series of capital A's), and varied in no respect but size. Snellen's types, however, do vary within the limits of the letters of the alphabet (in English, 26 variations), and the test dots require to be altered so as to present variations in shape also. These variations need not amount to more than six, of which many different combinations can be made. The simplest variations will consist of a dot, a square, a St. George's Cross, a St. Andrew's Cross, a quoit, and a dot bisected by a clear space. The arms of the crosses, the ring of the quoit, and the clear space bisecting the dot should each be 1·2 mm. in thickness (so that the component parts of these figures will be separated by an arc subtending at the prescribed distance a visual angle of 1').

This, it will be seen, is an extension of my original suggestion of making the dots square and round instead of round only. This extension is rendered feasible by adopting the plan which has lately occurred to me, of having white square bone counters, about the size of an eight-anna piece, on each of which is printed an enlarged figure similar in shape to one of the six figures in the dots. These counters would be kept in a box containing a separate compartment for each sort of counter, *i.e.*, six compartments in all (on top of which the test dot card would fit), and the recruit under examination directed to hand the examining officer from the box counters corresponding successively to the dots as seen from left to right.

There is yet a further requirement which occurs to me, and this is that the interval between adjacent dots should be of the same dimensions as the little square defining each dot. Thus, the interspaces will at the prescribed distance subtend a visual angle of 5' : a necessity if dots are not to be enumerated through visual perception of interspaces between them subtending larger visual angles than 5', perception of this sort existing within the limits of visual defect.

I recommend that the test dot card should be square and should contain 12 rows of figures, with 12 figures in each row. The card (as well as the shutter) should fit loosely into a cardboard frame so that it can be removed and replaced in such a position that dots at first aligned vertically, can be exposed on the horizontal plane, and *vice versâ*. The interval between each figure and its neighbours should equal in size the little square within which each figure is comprised, and the six varieties of figure should be so combined as to furnish two tests :—

1. Differentiation of figures closely resembling each other (for this purpose the dots will consist of combinations in successive lines of (*a*) the quoit and bisected dot, (*b*) the Cross of St. George and the Cross of St. Andrew, (*c*) the dot and the square).

2. Recognition of figures between which there is considerable difference (for this purpose the card is turned so that the vertical rows of dots are exposed. These will be found to include all six varieties of figure in each row). The procedure in testing the vision of a recruit will be as follows :—

The recruit will stand at 11½ ft. from the card. The dots will be exposed by a hospital assistant, and the examining officer will stand at the right of the recruit and direct him to produce successively from the counter box, counters corresponding to the dots seen, as read from left to right. The hospital assistant should be directed to expose the dots line by line from above downwards in succession as each line is read by the recruit. The recruit should be able to recognise clearly three lines of figures in each direction, horizontal and vertical. Ability to do this would establish proof of sound normal vision. Lesser degrees of vision than the normal can be accurately estimated by bringing the recruit a measured distance nearer to the test dot card and advancing him by equal distances until he is able to recognise the dots clearly. This test dot card thus furnishes a test for degrees of vision less than the normal, as well as a test for normal vision, and I believe that if generally adopted as a service test, it will be found to fulfil all practical requirements.

The dots and squares enclosing them would be of the same dimensions as in Indian Army form 1107 medical, their shape and arrangement, however, being altered as suggested above.

Since writing the above I have designed a set of test dots with duplicate counters, and rough specimens of both are attached to this letter. Their use is explained as follows :—

1. The test dots.

These consist of modifications of the square and round dot. These modifications are eight in number and lie in the partial and complete bisection of square and dot by clear interspaces. The number of dots is 64 in rows of eight both ways, and four complete changes can be effected according to the side of the square which is uppermost.

These dots at 3 metres (approximately 10 feet) furnish a reliable visual test.

The clear interspaces by which the different shapes of the dots are appreciated being 1 *millimetre* (*one*) in width subtend a visual angle of 1' at 3 metres. The dots themselves are each bounded by a square the sides of which are 5 *millimetres* (*five*) in length and subtend at 3 metres a visual angle of 5'. In respect of variety, shape and size these dots accurately correspond to

snellen's type D—6, (the measurements of the rough specimen are *not* accurate.)

2. The counters.

These are made of square pieces of cardboard and are inexpensive.

On each is printed an enlarged picture of one or other of the eight varieties of test dot.

The picture on each counter is comprised within a square, the sides of which are 15 *millimetres* (*fifteen*) in length. There should be eight counters of each sort to correspond with the number of dots in a row of the test card. There will thus be 48 counters in all, and the recruit under examination should be able to place counters on a table corresponding in number, order and position to the dots exposed to him on the test card.

The figures are simple and yet capable of considerable variation, and if a recruit be possessed of sound vision and yet unable to understand the *modus operandi* of the test when it has been carefully explained to him he is, in my opinion, unfit for enlistment on the ground of defective intelligence.

This test indeed is a test of intelligence, as well as of vision, and there appears to me to be this added advantage in its employment.

Each test card should have a cardboard case and shutter, the cardboard case being distinct from both."

LONDON LETTER.

HUMAN AND BOVINE TUBERCULOSIS.

IN a previous letter I drew attention to the startling pronouncement made by Professor Koch at the British Congress on Tuberculosis, held at St. James's Hall, London, in July 1901, to the effect that human and bovine tuberculosis were two separate and distinct diseases, caused by two different species of the tubercle bacillus, and that if there was any possibility at all of one of them being communicated to the proper hosts of the other, the risks were too slight to justify the taking of precautions against them. Apart from the profoundly interesting nature of the issue thus raised, it involved practical questions of such importance that it was felt that no time must be lost in submitting Koch's allegation to searching inquest. Accordingly a Royal Commission was appointed to perform experiments and take evidence on the subject. The members of the Commission were Sir Michael Foster, President, and Professors G. S. Woodhead, S. H. C. Martin, J. McFadyean and R. W. Boyce, whose names constituted a guarantee of sound work and reliable judgment. These gentlemen have recently submitted an interim report in which they produce evidence founded on a large experimental investigation, which goes to prove that Koch was wrong and that human and bovine tuberculosis are one and the same disease which can be communicated from cattle to man. Experiments to prove the converse proposition are obviously impossible, and this aspect of the question must continue to depend on clinical and inferential considerations. The Commission experimented on over 200 cattle. They employed more than twenty "strains" of tuberculous material derived from the human subject, contained in sputum and diseased tissues, and administered by feeding and inoculation. Seven of these "strains" promptly gave rise to acute tuberculosis of lungs, liver, spleen, lymphatic glands, &c. In eleven instances local developments of tuberculous disease resulted; but subsequent transmission of material taken from these lesions through the bodies of cattle and guinea-pigs caused intensification, and inoculation with material thus prepared gave rise to violent infection. The conclusion drawn from their experiments is thus summarised by the Commissioners:

"We have very carefully compared the disease thus set up in the bovine animal by material of human origin with that set up in the bovine animal by material of bovine origin, and so far we have found the one, both in its broad general features and in its finer histological details to be identical with the other. We have so far failed to discover any character by which we could distinguish the one from the other, and our records contain accounts of the *post-mortem* examinations of bovine animals infected with tuberculous material of human origin, which might be used as typical descriptions of ordinary bovine tuberculosis."

The importance of this judgment cannot be overrated, and it fully justifies the continuance of strict precautions against the consumption of tuberculous meat and milk.

MINER'S PHTHISIS.

In 1902 the attention of the Home Office was called to the prevalence of anæmia among workers in the mines of Cornwall. It was thought to be due to defective ventilation, and Dr. J. S. Haldane, F.R.S., was appointed to investigate the matter. He was assisted successively by Drs. Boycott and Scotts. These gentlemen soon discovered that among miners working in the Dolcoath Mine, Cambourne, anchylos-

miasis was very prevalent. This fact, which stood in interesting relation to the experience of the St. Gothard Tunnel, accounted for the "Dolcoath anæmia," but the excessive prevalence of, and mortality from, phthisis came subsequently into prominence in the inquiry and quite overshadowed the worm infection. The prevalence of tuberculous phthisis among miners has been for very long a subject of knowledge and concern, and the Dolcoath facts and statistics have forced it into acute and anxious notice. The inhalation of dust and mineral particles cause lung lesions which render these organs more vulnerable; but the infection must be present to cause specific results, and conditions must also exist which render infection the more easy and effective. Defective ventilation, the presence of heat and moisture and promiscuous expectoration are probably the chief of these. Prevention must take into account not only the exclusion of irritating particles from the respiratory passages, but also the correction of these conditions. The whole subject has recently been discussed at a meeting of the Institute of Mining and Metallurgy on the basis of the Dolcoath report, and the causation of miner's phthisis was considered from every point of view. The excess of consumption among metalliferous as compared with coal miners was prominently dwelt on and discussed. The operations of drilling and blasting were shown to be peculiarly dangerous. The use of jets of water and inhalers was carefully considered, and the presence of the tubercle bacillus in the sputum demonstrated. Good will undoubtedly result from these proceedings. It is interesting to note that Dr. R. H. Brembridge who had just returned from the Mysore gold mines, informed the meeting that phthisis was rare among natives employed in this industry.

An Overlooked Sponge.

The case of the "Missing Forceps" has been quickly followed by that of the "Overlooked Sponge," which has recently been tried by Mr. Justice Bruce and a special jury. The operator on this occasion was a lady doctor—Miss Mary Thorne, M.D., F.R.C.S.I. The patient underwent the operation of laparotomy for pelvic abscess in a surgical home and for a time appeared to have been quite restored to health and was correspondingly grateful. Unpleasant symptoms recurred after an interval, and another operation for abdominal abscess became necessary. This was done in the Sussex Hospital by Dr. Calvert, who found and removed a sponge of the variety called Mattress. The result of the second operation was entirely satisfactory, but the patient sued Miss Thorne for damages on account of negligence in failing to remove the sponge, and the pain and expense caused by the second operation. No charge of want of skill was imputed, and the question that arose during the trial was whether it is the duty of an operating surgeon to count sponges and satisfy himself that none of them has been left behind, or whether this responsibility may be committed to his assistants.

The jury found that the defendant was guilty of a want of due and reasonable care in the counting or superintending the counting of the sponges, and assessed the damages at one farthing, but afterwards under direction of the Judge, reconsidered their verdict and gave damages of £25 for pain and suffering. This, therefore, constitutes a distinct declaration, emphasised by the imposition of a money penalty, of the responsibility of the operating surgeon for the counting of all instruments and appliances used during an operation, and will have due weight in preventing an accident which Sir Frederick Treves characterises as "an unfortunate lack of care."

The Indian Medical Service.

Twenty-one lieutenants-on-probation have recently completed a course of instruction and training at Netley, and been pronounced qualified to receive their Commissions. At the examination which will take place in August thirteen vacancies have been advertised as open to competition. These gentlemen will also be sent to Netley for a two-months' course after studying for a similar period in London. The Royal Army Medical College will not probably be completed for two or three years; indeed the foundation-stone of the new building has not been as yet laid, and until this building has been raised and fitted, entrants into the Indian Medical Service will probably continue to be sent to Netley; the R. A. M. C. men going to Aldershot. Netley thus dies hard; but though it has practically been abolished as an "Army Medical School," it still retains some of its prestige and popularity.

K. McL.

Current Topics.

THE PREVENTION OF DISEASE IN ARMIES.

UNDER the title "*The Prevention of Disease in Armies in the Field*" Major Robert Caldwell, F.R.C.S., D.P.H., R.A.M.C., has published* the essay which has recently been awarded the Parkes Memorial Prize for 1904. The book is largely a record of the personal experience of the writer, and is illustrated by many cases and instances which the writer came across in his service in the Nile Campaigns and in the South African War. It is, therefore, the more valuable, it not being a theoretical essay by a London Surgeon waiting for practice, but a practical record of opinions formed in the field and under a variety of conditions.

Major Caldwell begins by pointing out the great influence which the health of the troops has had on the fortunes of war, and how persistently this side of war has been ignored by the military historian. It is true that the "medical history" of some campaigns have been written, but they have never emerged from the blue book stage of development, and are quite unknown even to the medical public. Here and there an historian or a novelist has used medical details to add to the horror of his picture of war as did Carlyle when he described the "latrines full of blood" in the Prussian Camps of the army marching towards Paris in September 1792, or when Zola used his marvellous realistic skill in painting the sufferings of the army shut up in Sedan—without chloroform in the hospitals.

In his second chapter Major Caldwell discusses the great field diseases of the soldier, *viz.*, enteric fever and dysentery. As might be expected from an officer with experience of typhoid in other countries than England, he is not enamoured of the exclusive water-borne theory of typhoid. While not doubting the existence of water-borne typhoid his main contention is that the influence of water-supply in this particular connection has been in the past, *comparatively speaking* (the italics are our author's), over-rated and other disease producing factors, notably soil pollution, have been overlooked or relegated to a position of minor importance. Major Caldwell is also a believer in the mutability of bacteria, and when one considers the gradual progress from diarrhœa to typhoid and dysentery, which has frequently been noted among marching troops, it is difficult to resist the conclusion, and such a transformation seems to us to fit in well with many ascertained facts.

While we would not go so far as Major Caldwell in disregarding importation of stray cases of enteric as the cause of epidemics, we can agree with him that the *fons et origo mali* is frequently in the occupation of polluted sites. In South Africa the same spots were over and over again occupied by troops, from military considerations, and "it is notorious that many columns were regardless of the condition in which they left their camping grounds."

We cannot find space for Major Caldwell's views on dysentery, but we commend them to our readers. Soil pollution and a disordered condition of the alimentary tract are the two factors he emphasises.

The account of malaria is somewhat meagre, though the facts are up-to-date. We are surprised, however, to find the time-honoured case of the transport *Argo* being again brought forward as an instance of water-borne malaria. We are of opinion that there is absolutly no grounds for thinking that the cases of fever on that transport were malarial at all, and certainly for 13 men out of 111 to die of fever on a short voyage from Algiers to Marseilles does not read like malaria. It is time that such cases were abolished from text-books on hygiene. We do not intend to refer to the many other chapters in this little book. It is very interesting reading, and we recommend it to the attention of our readers in military employ. The pictorial illustrations add much to its value, and at any rate it is important as the personal record of an experienced military medical officer.

* London, Balliere, Tindall and Cox, 1904.

MODES OF INFECTION IN TRYPANOSOMIASIS.

WE quote the following account of the modes of infection of trypanosomiasis in horses, in view of the great interest attaching to this infection as a disease of man:—

"So far as direct evidence goes, trypanosomiasis is a wound disease. The infectious agent must come in contact with a wounded surface, either skin or mucous membrane, and when these requirements are fulfilled, no matter how, in susceptible animals, the disease is the result A study of the modes of infection, then, consists in a study of the practical methods by which infectious material is brought into contact with wounded surfaces.

Biting flies have been, for ages, considered a means of transmission of the disease by natives in Africa and in certain districts of India, and these assertions have received the support of nearly all scientific writers on the subject for more than fifty years.

Absolute proof of this manner of transmission has been furnished from Africa, India, South America and other countries, and these observations have also been confirmed in the present investigation of the Philippine epidemic.

The period during which flies are capable of transmitting the disease after feeding on infected blood appears to be less than forty-eight hours. After this time trypanosoma have rarely been found in their body juices; emulsions made from them and injected into susceptible animals have not produced the disease; and direct biting experiments with them have been negative. This seems to demonstrate conclusively two things: That the action of the fly is mechanical, and that the fly does not act as an intermediate host for the trypanosoma. This point has an important bearing upon methods of

prevention in the spread of the disease, as will be shown when that part of the subject is discussed.

The conclusion that biting flies act simply as agents in the mechanical transmission of the disease forces us to regard all biting insects as dangerous. Even the common house fly, which does not bite, must be placed under ban, for in case of abrasion or other wounds on infected animals, and where healthy animals, also with abrasions, are in close proximity, the house fly can carry the infection on its legs from one wound to the other, just as it is known to carry the germs of typhoid fever, dysentery, cholera, and other diseases from dejections and other infected substances to our food and drink.

A varying percentage of rats are known to harbour a trypanosoma somewhat resembling the one found in the horse, and it has been conclusively shown in the present investigation that a certain number of rats in Manila harbour the same trypanosoma which causes the disease in other animals. These parasites have been determined both morphologically and in their pathogenic action to be identical with the parasite causing trypanosomiasis in horses.

Lingard claimed that some of the rat trypanosoma of India were pathogenic for the horse, but we are tempted to think that some of his rats were infected with *Trypanosoma evansi*, though he does not say so, just as are some of those in Manila. This explanation would clear up some of the confusing results arrived at by this author in regard to rat trypanosomiasis, and if true, would also add significance to the discovery that these animals in Manila occasionally harbour *Trypanosoma evansi*. It would also make very probable the suggestion that the disease Lingard thought transmitted by rat excreta in grain fed to horses was in reality transmitted by insects from rats infected with *Trypanosoma evansi*.

Rabinowitsch and Kempner proved that fleas were capable of transmitting the rat trypanosoma from rat to rat, and with this knowledge in view, we must also consider fleas capable of transmitting the "surra" parasite not only from rat to rat, but also from infected rats to horses, especially to those with wounds of any kind.

For practical purposes, *until investigators have shown exactly what insects are capable of transmitting the disease, all insects, including flies, fleas, lice, mosquitoes, etc., should be considered as agents in the spread of the disease and should be taken cognizance of in recommendations and procedures for its control.*

The great majority of writers agree that infection cannot take place through the sound mucosa of the alimentary tract and that the occasional infection following the administration by mouth of the virulent blood and organs of animals recently dead of the disease are probably due to the fact that these animals had damaged mucous membranes of the mouth or upper part of the alimentary canal, which would, of course, result in infection, just as would occur in any other part of the body by bringing an injured surface into contact with infectious material, or *vice versâ*.

In nearly all feeding experiments, large doses of the infective agent have been given, and in this sense they have not approached natural infection, which, from the nature of things and whether administered through the mucous membrane or the skin, would be in small doses.

Lingard attempted infection through the digestive canal by the administration of very small doses of infected blood given frequently in large dilutions of water. One of his horses that had received such treatment, and in addition one dose of 13 c. c of infected blood, developed the disease on the one hundred and thirtieth day after beginning the experiment. He fed a second horse 200 minims of fresh virulent blood at one dose, with an incubation period of seventy-five days. He does not state that these horses were protected from insects during the periods of the experiments, which were made in an infected country, and it is more than probable, considering the incubation periods of one hundred and thirty and seventy-five days, that his animals were infected in some other way.

So far as we have been able to discover, there is not in literature any absolute proof of infection through the sound mucosa by feeding.

In this preliminary report, but one of our many feeding experiments will be given.

Monkey No. 126—healthy adult male monkey—was isolated, temperature taken and blood examined daily for a week. The temperature remained normal and the blood negative for trypanosoma. After twelve hours' fasting, he was fed weekly for six weeks on cooked rice (the usual diet) soaked with fresh, warm virulent blood, rich in trypanosoma from different animals, at different feedings. On two occasions he was given to drink infected blood in weak potassium citrate solution, in which the trypanosoma live longer than in any other known solution outside of the body.

At the end of six weeks, the animal was apparently in good health, temperature had remained normal and the blood free from parasites. In order absolutely to exclude the existence of infection, a drop of his blood was infected subcutaneously into another monkey, which remained well and was afterwards proved susceptible. During the feeding, the infected rice would often be stored in his chops and remain there for hours.

After proving the animal not infected at the end of six weeks, a small scratch was made in the mucosa of the mouth, and he was again fed as before. The disease developed on the fourth day, as evidenced by rise in temperature and the presence of trypanosoma in the blood. He ran the regular course of the disease and died on the eighteenth day after inoculation.

Other possible means of mechanical transmission that suggest themselves are: The removal of a bridle from a diseased horse, especially one with a sore mouth, and placing it on a healthy animal: the changing of harness from an infected animal with sore shoulders or back to a healthy animal or the passing of a curry comb or brush over an injured surface in a sick animal and then over a healthy one with an injury of some kind.

The manner of perpetuation of an epidemic of trypanosomiasis in any country is a very important point in considering the prevention and eradication of the disease.

By the very nature of parasites and of parasitic diseases in general, we know that unless the disease is continuous, the parasite must have a natural host, or there must be a stage in its life cycle in which it can exist for an indefinite period outside the living body; otherwise the infection will disappear.

Many of the large tsetse fly areas are absolutely destitute of domestic animals, and probably some of them have never had one within their borders, and yet the flies in these districts are capable of infecting domestic animals. As it has been quite conclusively shown that the fly is not capable of carrying the infection at most but a short time, it necessarily means that there is a source of infection from which the flies are supplied, and the natural inference would be that the native source of infection is the wild animals in which the country abounds. It has already been shown that *some of these animals are susceptible* to the disease and that others harbour the parasites with little or no inconvenience. It is very probable that, were inoculation methods instead of microscopic blood examinations used for diagnostic purposes, a much larger percentage of these wild animals would be found infected than has generally been supposed.

Conditions in certain sections of South America are very much like those in Africa, and the indications are that the epidemic is perpetuated there in the same manner.

In India some observers claim that the cow acts as a host for the parasites over the long dry period in which there are not enough cases in horses to continue the infection. The probabilities are that a number of wild animals which exist in at least certain districts of India aid in this continuation It is claimed that in certain sections of the country there are two

varieties of animals which live in the bush, are susceptible to rinderpest and foot-and-mouth disease, but are not known to have "surra," though they are in infected areas. At certain seasons the flies are so numerous that these animals seek the open for protection from them. It would be interesting to test the blood of these animals by inoculation to see whether or not they are free from trypanosomiasis. In India, camels also may play an important part in carrying the infection from one fly season to the next, as it is stated that these animals may live as long as three years after infection.

From the foregoing, and if the disease continues to spread, it is evident that the wild animals of this country must be considered in dealing with the epidemic. If a certain portion of them are not already infected, it is only a question of time until they will be, and another difficult point in the solution of the problem will thus be produced.

The part that rats play in perpetuating an epidemic has not yet been fully determined, but the fact that at this time, in the middle of the dry season, a considerable number of these animals are found to be infected, and with the knowledge before us that the infection may be transmitted from one rat to another by fleas, which are numerous on rats at all seasons of the year, makes it probable that these animals play a very important part in perpetuating the infection in the Philippine Islands and in other countries.

However, so far as the city of Manila is concerned, it does not appear necessary to leave the horse family to discover how the infection is perpetuated. Now even during the dry season, one can, almost daily, see a horse, sick with surra, driven along the streets, and biting flies, although not by any means as numerous as during the wet season, are still plentiful enough to continue the infection.

The existence of an extra-corporeal stage of the trypanosoma living on grass and in water in marshy places, in this stage taken into the stomach of susceptible animals eating and drinking in these localities, and from this organ or other part of the animal economy passing into the blood in the forms we recognize, is without sufficient evidence to warrant consideration in this paper.

Before leaving this subject, however, for a fuller discussion in a subsequent paper, it is proper to state that the trypanosoma quickly die under all tried environments outside the body of some living creature, and no evidence of their existence in water, on grass or other similar places can be advanced. Both water and grass have been inoculated with large numbers of trypanosoma and have failed to convey the disease, after days, weeks or months, when fed to susceptible animals, and also when injected under the skin.

Malaria is similar to trypanosomiasis, in that both are parasitic diseases and both are prevalent in low-lying, marshy lands and during wet weather. Malaria was for ages attributed to the air, the water, etc, of these marshes, and it took years to make the public understand that all these conditions are harmless in producing it, provided the patient is protected from the bite of mosquitoes, so prevalent in these regions.

Take the epidemic of trypanosomiasis in Manila. At the time of its outbreak and for some time afterwards, it was confined to the city. The grass and water given the horses was the same which had been fed for years, and no disease resulted.

The disease started from a focus of infection and spread directly with exposure to infected animals, and attacked alike animals fed exclusively on hay and on oats and those fed on grass. The disease is prevalent in Manila at the present time and has been so continuously since its introduction. The majority of the horses having the disease, under our observation for the past four months, had previously been fed entirely on hay and oats

In one large stable, with both American and native horses, four of the American horses and mules (fed entirely on dry feed) and two of the native ponies have died of the disease, and one of the two ponies was the only horse of this class in the stable which received dry feed only.

The statement is made that certain districts in India are avoided by cavalry troops on the march because of the danger in these districts from food and drink through which the animals may contract the disease. Similar conditions are found in South America, but in addition it has been shown that infected districts on this continent are just as dangerous to horses provided with dry food and pure water while passing through them as they are to animals eating forage grown on the spot.

It has been shown by a number of observers that an infected animal taken to a new place becomes a focus for the spread of the disease, provided biting flies are present, no matter whether the territory is marshy or dry. All animals in marshy places do not contract the disease, although they drink the same water and eat the same food, and yet all workers agree in believing horses to be susceptible invariably.

If it were possible to destroy every infected animal in the Philippine Islands and to protect the remaining ones from infected flies for forty-eight hours, there would never be another case of "surra" in this country unless it were introduced again from an infected locality. The same conditions existing before its introduction would be reproduced and animals could go on eating grass and drinking the water as before, notwithstanding "floods, inundations and storms" Biting flies and other insects would be harmless, because there would be no infected material for them to feed upon.

Of course, all infected animals cannot be destroyed at once, but it can be done gradually, and the same result accomplished This should be our method of warfare against the disease, and now is the time to begin, before the rains again hatch out millions of biting flies rapidly to increase the number of cases. During the present dry weather, while comparatively few cases exist, a systematic examination of all animals and the destruction of those found infected would prevent a great increase of the disease, which, without some such effort, is sure to reappear with the season of flies.

It is not possible, from a practical standpoint, to destroy all flies, and were it possible, it is much easier and simpler to render the flies harmless by destroying the sources of infection. The diseased horse is less than worthless, for he is sure to die and to preserve him is both a waste of food and a menace to other animals.

There is another point in this connection which already adds materially to the seriousness of the situation, and this is the fact, already mentioned in this report, that a certain number of the "Manila rats" are infected with the trypanosoma of the horse epidemic. Just what part these little pests are going to play toward perpetuating the epidemic and in the spread of the disease in horses is difficult to foresee The question is still under study and will be more fully considered in the completed report The destruction of rats in Manila on account of bubonic plague will probably accomplish the additional result of lessening the sources of infection from surra.

RULES FOR MOSQUITO DESTRUCTION.

THE following rules for mosquito destruction have been circulated in Texas, in places threatened with the invasion of yellow fever.

They sum up in a practical way the steps needed to exterminate mosquitoes:

"1. Mosquitoes breed only in water; usually fresh, standing water in artificial places.

2. Mosquitoes occur in the vicinity in which they breed. Invasions from long distance are exceptional.

3. The young mosquito, or "wiggler," lives in water at least seven or twelve days.
4. Although the wigglers live in water, they must come frequently to the surface to breathe.
5. Coal oil on the surface of the water prevents the wigglers from breathing.
6. Destroy the breeding places and you will destroy the mosquitoes.
7. Empty the water from all tubs, buckets, cans, flower pots, vases, once every forty-eight hours.
8. Fill or drain all pools, ditches, and various excavations, as postholes left unfilled, etc.
9. Change regularly every day all water needed in chicken coops, kennels, etc
10. Treat with coal oil all standing water which can not be screened or drained (1 ounce of oil will cover 15 square feet of surface). The oil does not affect the water for use if the water is drawn from below.
11. Put fine wire netting over cisterns, wells, and tanks of water in everyday use.
12. Places in which it is undesirable to place oil, such as watering troughs for stock, lily ponds, etc, can be kept free of the wigglers by putting in goldfish. The nymphs of dragon flies and tadpoles of frogs also feed on the wigglers.
13. Clean away all weeds, grass, and bushes about ditches, ponds, and other possible breeding places, since these afford a hiding place for the adult mosquitoes.
14. Clean up vacant lots and back-yards of all cans, tins, bottles, and rubbish.
15. First do away with or treat all places where mosquitoes are known to breed, and then begin work on places where they might breed.
16. As a citizen of your community you should feel a personal responsibility for the destruction of the mosquitoes in your district and seek to co-operate with your neighbors in the work of doing away with breeding places. Inspect and treat with coal oil, gutters, culverts, ditches, manholes, catching basins, etc., along the roadside. Manhole covers should be screened.
17. Where oil is applied to standing water it must be distributed evenly over the surface
18. Houses should be cleared of all winged mosquitoes. by the burning of insect powder or sulphur. The mosquitoes will fall to the floor, and should be collected and burned
19. Relief in any community or district depends entire upon the co-operation of the members of the community."

HYTHER AND EUGENICS.

"HYTHER" is a word coined by Mr. W. F. Tyler, F.R. MET. SOC., in a scheme which he has advanced for a comparison of climates by the establishment of a climatic scale, details of which are published in the *Journal of Balneology and Climatology* (January 1904). The word is intended to indicate the joint effect of temperature and humidity upon human sensation, these being, in his opinion, the two most important of the meteorological conditions which influence sensation, especially as considerable variations in them, provided these be according to fixed principles, produce similar sensations of climate; *e.g.*, with the dry bulb at 77° F. and the wet bulb at 76° F., the climatic condition, as far as subjective appreciation is concerned, would be the same as with the dry bulb at 90° F. and the wet bulb at 79° F.

Mr. Tyler hopes, by a comparison of the "hyther" of different places (the maxima, minima, and medium quantities) to be able to fix a scale showing the relative effects to be expected from such. Before this can be done, however, the principles governing the effects of temperature and humidity must be discovered; at present subjective sensations alone have to be relied upon, and few, perhaps, are conscious of the possession of the faculty of being able to personally estimate "hyther," which faculty would soon become common property were such a scale to become an accomplished fact.

In his observations, he caused a number of healthy persons of regular habits to note, daily, at noon, their sensation of the climatic condition on a scale ranging from 0 (an ideal summer's day with no discomfort) to 10 (equal to the hottest day experienced by the observer in Shanghai). The results of the different observers, when compared, showed a very striking resemblance, even in some instances, to decimal fractions; and he considers this to be evidence of the possession of the faculty, at all events, in some people.

"Eugenics," another new word, was invented by Mr. F. Galton, F.R.S., the distinguished statistician and student of heredity, who holds so prominent a place in the new Society (Sociological) which aims at the improvement of the human race by the careful selection of the parents of future generations, a process now to be known as "Eugenics." Of the word the *Lancet* writes that though Mr. Galton's "invention and earlier use of it has secured for it a place in the English language—so far as that distinction can be afforded by the great Oxford Dictionary—it still can hardly be said to convey, as a matter of etymology, all that its author or inventor seeks to place upon its shoulders."

We are told that the "Science" of Eugenics deals with all influences that improve the inborn qualities of a race, and develop them to the utmost advantage, but, writes the same journal, "if we accept the common definition of 'Science' and employ the word to mean methodically arranged or digested knowledge, we must humbly express a doubt whether any science of eugenics is at present in existence, or whether there is any probability of its being constituted at an early date.

So far as we know, only one meeting of the Sociological Society has been held. This was largely attended, and, as meetings go, was successful. Many platitudes were forthcoming, and much uttered to the effect that the solution of certain obscure problems merely required the marshalling and wide diffusion of facts best calculated to lead to such solutions. Platitudes and axioms, however, are not sufficient in a practical world; and, while extending all sympathy to a society with such worthy aims, we would, with our above-quoted contemporary, commend to the members the desirableness of making sufficiently weighty representations to attract *public* attention upon the pressing social problems of the day; such as, for ex-

ample, the concomitance of a diminishing birth-rate with the fact that we have to cherish many undesirables whose children are, at once, a danger and a disgrace; the fact that thousands of slum children are the offspring of degraded parents whose tendencies they inherit, &c., &c.

EPIDEMIC GLANDULAR FEVER OF CHILDREN.

IN a paper read before the Bombay Medical and Physical Society, Lieut.-Col. Bannerman, Director of the Plague Research Laboratory, Bombay, has given an interesting account of the above disease, quoting a most instructive and typical case.

He defines the affection as an acute infectious disease, occurring in children under fourteen years of age, followed, after a few days of fever, by enlargement of lymphatic glands, which are often successively affected, in groups, in various parts of the body, each fresh development being preceded and accompanied by a renewal of the fever, simulating a relapse.

The earliest glands affected are generally those at the back of the neck, or under the sterno-mastoid (the left more commonly than the right), and the enlargement is accompanied by complete loss of appetite, difficulty in swallowing, and often a hoarse croupy cough.

The affected glands seldom or never suppurate, and the fever continues, so long as successive groups of glands are becoming affected; but with gradually abating severity as the cases advance.

The liver and spleen both become enlarged, and hæmorrhagic nephritis sometimes occurs.

The disease is generally prolonged for weeks, but occasionally subsides after only one set of glands has been attacked. Convalescence is always protracted, and in severe cases, is attended with anæmia and emaciation.

The difficulty of swallowing, and the croupy cough, Lieut.-Col. Bannerman regards as probably reflex pressure symptoms occasioned by enlargement of the bronchial glands.

Diagnosis is arrived at mainly by elimination, the following being the conditions for which it might be mistaken, *viz.*, dentition, malaria, influenza, scarlatina, plague, meningitis, and indolent buboes.

The geographical distribution is extensive, epidemics having been reported from Russia, Germany, England, America and China.

Outbreaks, as a rule, are confined to particular families and but few of the younger members of such escape.

The pathology is still obscure. Dawson Williams suggests that the primary infection is from the intestine, so many cases having enlarged mesenteric glands; and that the left cervical glands are first affected from their relation to the thoracic duct. Hainebach thinks that the infection enters through the pharynx or naso-pharynx; but Lieut.-Col. Bannerman considers that if this were so, pharyngitis would be severe instead of invariably slight and sometimes absent.

As to treatment, this can only be symptomatic, there being no known means of modifying the course of the disease. Tonics and a change of air are beneficial during convalescence.

INFECTIVITY OF DISEASES DURING THE INCUBATION PERIOD.

IN an article in the *Journal of State Medicine* (May 1904), Dr. H. S. Wilson of King's College, London, adduces evidence to demonstrate that both typhoid fever and diphtheria are infectious during the incubation period, and that the latter can be transmitted by a healthy person who is either temporarily or permanently immune.

As regards typhoid, he surmises that, before entering the circulation in the patches of lymphoid tissue known as the "Solitary" and "Peyers" glands, the specific bacilli actively multiply in the fluid contents of the small intestine, and that some pass into the large intestine and escape in the fæces, so that these become infective; it had been the practice to disregard the possibility of such a contingency, owing to failure to isolate the bacilli in the early stages, but the use of the culture medium devised by Digralski and Conradi, which gives pure cultures even when the number of the bacilli is very small, has recently afforded corroborative testimony in support of the view that the stools are infective throughout.

This conclusion regarding diphtheria is based on the facts that virulent bacilli may be harboured for a considerable time by persons who remain in normal health, and that bacilli have frequently been found in persons who, though apparently healthy at the moment of examination, developed the clinical symptoms of the disease a few days later.

It has been definitely stated by other observers that small-pox, measles, scarlatina, and other infectious diseases, are communicable during the incubation period, but bacteriological evidence of such is not available, and Dr. Wilson considers that analogies between diseases of known and those of unknown micro-biology are probably misleading. He draws attention, however, to an interesting point in connection with small-pox; in this disease, as the virus is believed to enter by the respiratory tract, the breath is probably highly infectious, and vaccinated or otherwise immune persons who have been in contact with the disease might become sources of infection by retaining the contagion in their respiratory tracts.

The utility of the establishment of all such new epidemiological knowledge obviously lies in its application to prophylactic measures.

CHLOROFORMED CALF VACCINE.

WE understand that Capt. Clemesha, I.M.S., Deputy Sanitary Commissioner, Bengal, has been experimenting with success on Chloroformed Calf Vaccine. In the *Lancet* (May 28th) Dr. A. B. Green, of the Government Lymph Laboratories, London, gives an account of his work on this subject, which is worthy of attention. He claims that "these lymphs have been freed from their non-spore-bearing extraneous bacteria within a period ranging between one and eight hours after their collection from the calf and have, subject to the usual tests, been issued for general vaccination purposes about two weeks after collection. Their use has resulted in high case and insertion success."

It has also been shown that the elimination of extraneous micro-organisms is largely determined by the temperature at which vaccine emulsion is subjected to the chloroform process, and the temperature at which extraneous bacteria in vaccine emulsion are killed most quickly is between 18° and 23° C. (66° and 74° F.).

Dr. Green also points out that baccillus coli, b. typhosus, b. tuberculosis, b. pestis, and spirillum choleræ Asiaticæ are also destroyed by this chloroform process.

Dr. Green summarises his article as follows:—

"Experience of the further use of the chloroform process in the preparation of a large number of vaccines during the past year confirms the conclusions ..... and meanwhile important additional knowledge has been gained, namely that chloroformed vaccine lymph, if originally of sufficiently high potency, will, when prepared and stored under suitable conditions, retain for a considerable time a high degree of potency, and this notwithstanding that the extraneous organisms had been rapidly eliminated from it at an early stage of its preparation."

CHLORIDE OF LIME AS A DISINFECTANT.

THE following are the conclusions drawn by Mr. E. H. Hankin, of the Agra Laboratory on the value of chloride of lime as a disinfectant. It is to be noticed that chloride of lime that has been kept for some months in an Indian climate and that no longer gives off the smell of chlorine is useless for destroying microbes. Mr. Hankin, points out that "specimens having the form of a coarsely granular powder keeps longer than other specimens in which the material takes the form of adherent masses."

These results of Mr. Hankin's experiments are summarised by him as follows:—

(1) Chloride of lime, when fit for use, has a strong smell of chlorine. If it has been kept in a hot climate for three months, the amount of available chlorine present will usually be about one-third of what it was originally. After the lapse of the above period the amount of available chlorine may be less and the substance will then be unfit for use.

(2) Chloride of lime is readily attacked by various kinds of organic matter. Therefore it is unsuitable for dealing with sewage or other large masses of putrefying material. On the other hand it may be used with advantage in places where the infective material can only be embedded in small amounts of organic matter.

(3) Owing to its deodorant properties and penetrative power, chloride of lime may be used in the interior of infected houses, both on the walls, on furniture, or on cement or stone floors.

(4) Whitewash made in the usual way with quicklime is rendered far more active if half a pound of chloride of lime is added to every *hand*-ful (about 7 gallons) of the liquid.

(1) Owing to the high bactericidal power of chloride of lime under circumstances in which its action is not masked by the presence of an excess of organic matter, it is likely that it could be useful in cleaning and disinfection of wells, either in place of, or mixed with permanganate. Owing to the unpalatable taste of chloride of lime, it would however be necessary to pump out the well, preferably on the following day, before bringing the water of the well into use.

CEREBROSPINAL FEVER IN INDIA

THE extent to which cerebrospinal fever has come to be recognised as one of the continued fevers of India may be understood from the following figures:—In the European army one case recovered; in the Native army 18 cases with 17 deaths, in prisons 136 cases with 108 deaths in the year 1902. In the Native army in 1902 there were 5 cases among the troops employed on the Mahshud blockade, 4 cases in the 29th Punjabis at Sarwekai, two cases each at Miran Shah and Ajmere, one case each at Jullundur, Ferozepore, Myitkyina, Kamptee and Loralai. The Medical Officer of the 4th Sikhs said that cerebrospinal fever was always present among the civil population of Miran Shah and neighbourhood, and three such cases were seen by him at the same periods as the regimental cases occurred.

In the jails of India, as said above, there were 136 cases in 1902, as compared with 141 cases in the preceding year. The following figures show the increased recognition, we hesitate to say the increased prevalence, of this terrible disease:—

1896, seven cases; 1897, thirteen; 1898, twenty-four; 1898, twenty-nine; 1899, ninety-nine; 1900, one hundred and forty-one; and 1902, one hundred and thirty-six. In 1899 six jails had cases, in 1900 seventeen, in 1901 twenty, and in

1902, nineteen. The following jails had cases in some of these years: Alipore, Bhagalpore, Ferozepore, Rohtak, Hissar, Sambalpore, Mung Rasul, Delhi, Allahabad, Fyzabad, Jubbulpore, Fatehpur, Ahmedabad, and Akyab. The irregular incidence of cases is shown in the following figures, representing the cases month by month: At Ahmedabad the monthly distribution was as follows:—0, 10, 16, 11, 2, 0, 0, 3, 0, 0, 0, 0; the 35 cases at Mung Rasul came as follows:—5, 7, 8, 5, 2, 2, 0, 0, 0, 3, 0, 3; the fourteen cases at Delhi, 0, 0, 0, 1, 12, 0, 0, 1, 0, 0, 0, 0; the eleven cases at Bhagalpore, 3, 2, 2, 0, 0, 1, 0, 3, 0, 0, 0, 0; the ten cases at Allahabad, 4, 4, 2, 0, 0, 0, 0, 0, 0, 0, 0, 0.

The opinion that cases of this disease are frequent among the free population is gaining ground, though we know of no definite observations on this important point. As regards the bacteriology of the disease, recent work on the Continent only leaves us more hazy and confused than we were before. In our experience the disease can occur in the most excellent hygienic surroundings, as for example in the fine well-ventilated modern barracks at the Bhagalpore Central Jail.

THE DIFFERENTIATION OF HUMAN BLOOD.

OUR readers will remember the description given in our Current Literature columns in the May issue of the Ehrenrooth method of distinguishing human blood from that of other mammalian animals. In introducing the subject our esteemed correspondent W.D.S. remarked:—"How many Civil Surgeons in India have had to reply 'I cannot say,' to the question—Was the blood which you found on the clothes, weapons, &c., human blood? and how many criminals have got off on the plea that the blood was that of a goat or other mammal we know not, but we are glad to learn that at last a definite test has been devised by which one may say with certainty that it is human."

Another correspondent has directed our attention to the fact that last year a serum was prepared in one of our Indian laboratories, and we understand that a request was made for the services of a special medical officer to carry on the experiments and to keep a supply of serum for use of medical men in the country. We regret that it was not found possible to carry out this scheme. We are sure that it was in the highest interests of justice that this matter be established, and this method made use of in medico-legal work. We have no doubt that as soon as it has reached the ears of judicial officers that it is possible to differentiate human from other mammalian blood, they will demand that this be done, and we strongly urge that arrangements be made in some of the laboratories in India for enabling these experiments to be carried out. We have no doubt that if the Chemical Examiners in India were consulted, they would agree unanimously that it was most important that human blood should be differentiated from the blood of other mammalia, and that it is in the interests of justice that the medico-legal expert should be able to say that a certain specimen submitted to him was or was not human blood.

TYPHOID FEVER AMONG NATIVES OF INDIA.

OUR apology for re-opening this well-worn subject is the remark of the Sanitary Commissioner with the Government of India (Report for 1902, p. 36) on this subject. He points out that the carefully recorded statistics in the Native army and in the Indian prisons "do not reflect the opinion, so prominent of late, that enteric fever is quite common among *adult* natives of India." The admission-ratio per 1,000 from enteric fever among European troops was 16·7 and the death-ratio 4·2. For native troops the corresponding figures were ·4 and ·10, and for prisoners ·6 and ·13. By those who consider that enteric fever is common among natives, the small number of cases recorded among native troops and prisoners is usually accounted for, on the supposition that enteric fever, when it occurs among these classes of people, is not correctly diagnosed, but is returned under the heading of some other fever, such as ague, remittent fever, or simple continued fever. If this were the case, we should expect the death-rates from these other fevers to be high. The death-rates of all diseases, under which enteric fever might possibly be returned, may be compared with regard to European troops, Native troops, and prisoners by means of the accompanying table, *viz.*:—

	European troops.	Native troops.	Prisoners.
	Deaths per mille, 1902.	Deaths per mille, 1902.	Deaths per mille, 1902.
Enteric ...	4·29	·10	·13
Intermittent ..	50	·89	1·10
Remittent ...	·20	1·14	·78
S. C. fever ...	...	·03	·01
Total fever mortality ..	4·99	2·17	2·02

From this it will be seen that, taking either Native troops or prisoners, their mortality *from all fevers* was considerably below that of European troops *from enteric fever alone*. . . . The conclusion to be drawn from these figures is sufficiently obvious.

This, it must be admitted, is an argument difficult to upset, and we invite opinions on the question.

THE KASHMIR MEDICAL MISSION.

OUR pages for many years past have been enriched with the records of the good surgical and medical work done in the hospitals of the

Kashmir Medical Mission, and to our readers the names of Mr. Arthur Neve, F.R.C.S., (Ed.) and Dr. E. F. Neve are very well known. We have received the annual report of the medical work of the mission for 1903. The introduction describes the floods of June 1903, which did so much damage in the neighbourhood of Srinagar. So with flood, scarcity and even plague, the "Happy Valley" was not so pleasant as is usual. The summary notes no less than 3,390 operations. The writer comments upon the rarity of tuberculous disease of glands and joints as compared with their frequency in British hospitals. "Appendicitis is extremely rare. If we except the peculiar *kangri*-burn cancer, of which we had 65 cases, malignant disease is not common in Kashmir. Our returns for the past year show only two cases of carcinoma of the breast, and 19 instances of sarcoma. Two more successful ovariotomies were performed. Both ovarian and fibroid tumours are relatively quite rare. On the other hand, as is usual in the East, eye diseases are common. For entropion alone, 480 operations were required, and for pterygium 237. Altogether there were more than 1,000 operations for eye diseases," (including 80 for cataract).

WE direct attention to the interesting article on the discovery of Piroplasmosis in Madras by Major C. Donovan, I.M.S. It appears as if these bodies, which are probably trypanosomes, were to afford the clue to the long prevalent mystery of the nature of the cases we were wont to call "chronic malaria" or malarial cachexia—a symptom-group everywhere in India well-known and recognizable.

THE article on the use of permanganate of potash in snake bite by Sir Lauder Brunton, F.R.S., Sir Joseph Fayrer, Bart., and Leonard Rogers, I.M.S., is of great interest and importance, and we direct the attention of our readers in the *mofussal* to the use of the permanganate.

A RECENT article in the *Atlantic Monthly* pitilessly and logically denounced Eddyism and the ways of "Christian Scientists." Eddyism not only, according to the writer, defies the canons of history, but is "specious philosophy, superficial science and a caricature on Christianity."

HERE is another account of a successful anti-mosquito campaign. How are we to understand these. ?

"THE State Surgeon of Selangor, one of the Federated States of the Malay Peninsula, has described a severe outbreak of malignant malarial fever in the malarial district of Klang. A new port was constructed and opened under the name of Port Swettenham in September, 1901. Almost immediately malaria increased to an alarming extent. Almost the whole of the laborers were attacked, and many severe cases occurred among the ships' crews. Of 133 persons living in Government quarters 80 were attacked between September 15 and November 26. Of 27 temporary shop-houses with 127 inmates, no fewer than 78 persons living in 25 of the shops contracted the disease during the same period. Blocked drains and shallow pools were found along the whole sea front and by the side of the road, containing large numbers of anopheles and culex larvæ. A drainage scheme was carried out and all pools containing larvæ were regularly sprinkled with crude kerosene oil. The majority of the coolies working at the port were given a daily dose of 10 grains of quinine. By December 10 marked improvement was reported. During 1901, 52 deaths from malarial fever occurred in the district hospital; in 1902 there were only 9 deaths. In the town of Klang and the port of Swettenham, where extensive sanitary works were carried out, malarial fever has decreased by 67 per cent., whereas in the remainder of the Klang district, which has not been dealt with in any way, malarial fever has increased by 3·5 per cent.

It is claimed (*Munch. Medicin, Wochen.*) that the biological test for human blood gave positive tests in the case of an Egyptian mummy, 5,000 years old.

THE June number of the *Journal* of the R.A.M.C. contains a very valuable article on flies as disseminators of enteric fever, from the pen of Mr. E. E. Austen, of the British Museum.

IT is extraordinary how the British medical public will not listen to the ever-increasing evidence against flies, and how they still cling to the exclusive water-borne theory of the spread of typhoid.

MAJOR S. Glen Allen, R.A.M.C., pleads for the adoption as a "working hypothesis" of the view that Malta Fever is spread by means of a suctorial insect.

THE Parkes Memorial Prize for 1903, has been awarded to Major R. Caldwell, R.A.M.C., for his Essay, now published, under the title of the *Prevention of Disease in Armies in the Field.*

FOR 1906 the subject chosen is: "The Sanitary Requirements of Naval and Military units in Peace and War." The value of the prize is a bronze medal and 75 guineas.

A CORRESPONDENT, J. R. A., points out to us that enormous doses of Carbolic Acid have been successfully used for Plague—see *Medical Annual*, 1904, p. 587. We regret we did not notice this when criticising the doses advocated by Assistant Surgeon Hidayat Ulla in his article in our last issue (p. 287).

Reviews.

A Clinical Handbook of Urine Analysis. By C. H. BEDFORD, M.D., D.SC. (EDIN.), Major, I.M.S., Professor of Chemistry, Calcutta Medical College, &c. Second edition, 1904. Edinburgh: Bell and Bradfute.

MOST of our readers are acquainted with the first edition of Major Bedford's practical and useful volume on Urine Analysis. The first edition has had a wide circulation in India, and we are glad, but not surprised, to hear that the second edition has been taken up by nearly every London Hospital, and by many Edinburgh and Provincial Clinical teachers. Such a book, we think, meets a distinct want; it is thoroughly practical and deals with tests of purely clinical applicablity, and it is to the clinical student, and the medical practitioner to which it appeals. In India we think the book should have a wide circulation. The laboratories in India are few and far between, consequently the clinical physician has to rely on himself, and for him such a book as that of Major Bedford's is clearly most useful and necessary.

We have therefore no hesitation in strongly recommending the second edition of this book to the attention of Civil Surgeons in India.

Three New Medical Journals. On our table lie three New Medical Journals, whose promoters appear to believe that a future lies before them. The first of these is the *British Journal of Children's Diseases*, which appeared in January of this year.

It appears that an Anglo-American journal of children's diseases was born in 1896, but the Anglican twin appears to have died of marasmus in early infancy while the American continues to flourish and now rejoices in an assured position. There appears to be little doubt that American physicians were ahead of their British compeers in the study of the diseases of childhood, and several Pedriatic Societies testify to the interest taken in the subject by physicians and surgeons in the United States. The present journal will attempt to do for the study of children's diseases what similar specialist journals do in America and on the Continent, and we wish it every success. The first number consisted of an introduction, some original articles, editorial articles, report of the proceedings of the "Society for the Study of the Diseases of Children" excerpta puerilia, abstracts from current literature, reviews of books, &c. The paper is well got up, and under the editorship of Dr. George Carpenter; it will, we doubt not, make a brave bid for success. The publishers are Messrs. Adlard and Son, Bartholomew Close, London, E. C., and its monthly price is 1*s.*

The Antiseptic—The second new journal before us hails from Madras, it is entitled "The Antiseptic, a monthly journal of medicine and surgery." It is edited by Dr. T. M. NAIR, and its first number appeared in May, 1904.

As might be presumed from the title adopted for the new magazine it devotes its introduction to a resumé of the life of Lord Lister, taken from the Jubilee number of the *British Medical Journal*. It contains one original article by the editor, a note on intestinal atony, by Dr. M. C. N. Rao of the Chemical Examiner's Department, Madras, a further series of excerpts by the editor and a note on treatment of tinea tonsurans by Mr. U. R. Rao. Then follows a sort of introduction headed "Our compliments to the medical profession," which consists of a review of the various classes of medical men in India, from the Indian Medical Service to Hospital Assistant, the class known to Madras as "C. S. I." (Sanitary Inspectors), private practitioners, &c. As regards the I. M. S., the writer points out that while officers of that service may have spent £1,500 more on their education than have officers of the Civil Service, yet the I. M. S. have to play "second fiddle," as our author puts it. Next comes a statement of the case of the Assistant-Surgeons, and it is thought that promotion to Civil Surgeoncies is governed on the lines of Lord Melbourne's Selections for the Order of the Garter, that is that "there was no d—d question of merit about it." The difference in pay and prospects between that hard-worked and useful class, the Civil Hospital Assistants, and the newly appointed "C. S. I." is pointed out. It appears that the latter functionaries begin on Rs. 70 per month pay—"after ten days' training in Madras." The case of the private practitioner, is, according to "The Antiseptic" still more dismal, but we would fain believe that his fate as here described is exaggerated.

We have perhaps said enough to indicate the scope of the new journal. We sincerely wish it all the success it deserves. *We cannot find in the first number the cost of the Journal, nor the name of the publishers.*

The International Journal of Surgery. This is not a new journal, but the proprietors have started what they call an Oriental Edition, which will appeal to many surgeons abroad. The Journal is a monthly and costs only 6 shillings a year. It hails from New York. and has the following contents:—The value of a fæcal fistula in typhoid perforation—by Williard Bartlett, of St. Louis, which shows the advance the Surgeon has made in this fell complication since Osler wrote "we folded our hands and murmured that all was over." The next article is on paralysis of the bowel, another on a new operation in *spina lyfida*. Dr. W. M. Brickner of the Mt. Sinai Hospital, N. Y., has a well illustrated and practical article on the "Surgical Assistant," showing the use of an assistant and what he is to do in

plastic operations on the vagina and perinæum. The "Clinical Department," which corresponds to our "Mirror of Practice" has only one article on carcinoma of the pylorus. Then follow interesting letters from the surgical cliniques of Berlin, Vienna, Paris and London. Perhaps the most interesting announcement is in the letter from Vienna, where Dr. Sato of Japan has created a "sensation" by his new procedure of anastomosis of the gastro-intestinal tract without opening into the lumen of the gut. Railway surgery forms a feature of this journal. It is one worth the attention of the Surgeon in India.

Medical Laboratory Methods and Tests.—By HERBERT FRENCH, M.A., M.D. (Oxen.) M.R.C.P. (Lond.), Medical Registrar, Guy's Hospital; Gillson Scholar, Society of Apothecaries, London; Radcliffe Travelling Scholar, Oxford University. With 73 Illustrations in the text. London: Baillière, Tindall and Cox, 1904. Crown 8vo. pp. viii and 152. Price 3*s.* 6*d. nett.*

THIS volume, as explained by the author in the preface, has been written with the object of providing a *small* book, dealing with the commoner methods of chemical and microscopical tests and investigations.

It is clearly and succinctly written and the tests given are fully explained. A most useful portion of the work consists in giving, after most of the principal tests, the special fallacies to which each is liable, and the clinical significance of the more common pathological variations found.

The opening chapter on the examination of the urine is particularly full and good, all the chief tests, both qualitative and quantitative, being given.

The second chapter, dealing with the examination of the blood, includes the differential leucocyte count, the detection of the presence of the more important blood parasites, Widal's reaction, etc. With regard to this latter, the form of glass pipette, recommended by Professor Wright, for the collection of blood from the patient, appears to us to possess several advantages over that described by the author, not the least of which is the doing away of the necessity of sucking up the blood into the pipette.

The chapter on the examination of the sputum deals with both its macroscopical and microscopical characters as found in different morbid conditions, the staining for tubercle bacilli being fully and carefully described.

That portion of the book dealing with the examination of pus includes the various methods of staining for the more important micro-organisms commonly found therein.

There is a very good short account given of the examination of the gastric contents, which contains all that is necessary for the more ordinary cases likely to be met with in general practice.

The concluding chapters dealing with the examination of the fæces, the microscopical examination of skin affections, and the examination of serous exudations, cerebro-spinal and cystic fluids, although short, appear to contain all the more common and important tests, etc., necessary for ordinary purposes.

The book will, we think, supply a distinct want, and should prove most useful to both the student and busy practitioner.

The illustrations as a whole are very rough and diagrammatic, and it seems a pity that many of them, more especially those of the various micro-organisms, should not have been executed in a better manner, as this would undoubtedly have enhanced the value of the book.

Diseases of the Gall Bladder and Bileducts including Gallstones. By A. W. MAYO ROBSON, F.R.C.S., assisted by J. F. DOBSON, M.S (LOND.), F.R.C.S. Third Edition. London: Baillière, Tindall and Cox, 1904. Pages xvi and 485. Illustrations 73. Demy 8vo. 15*s. net.*

SINCE the last edition of this book so much work has been done on the subject of diseases of the gall-bladder that the author has found it necessary to recast the whole book and also to enlarge it very considerably. The opening chapters deal with the anatomy and physiology of the gall-bladder and the bile, including accurate statements of the amount passed in several cases of biliary fistulæ which were under the author's care; and the effect on the amount and rate of flow of the bile, of the administration of several different drugs which are credited with a cholagogue action; their administration, however, in these cases made little or no difference. Chapter III deals with injuries of the gall-bladder, with an account of a number of cases collected from various sources. Inflammatory affections are very thoroughly described in Chapter IV, with many illustrative cases either of the author's own or from published cases. This method of illustration by cases is continued throughout the book and is very valuable. Intestinal obstruction from gall-stones either by the mechanical occlusion of the gut from their size alone or from their secondary effects is admirably described. The section descriptive of the pathology and symptoms of the tumours is well up to the high standard of the rest of the work. The concluding chapters deal with cholelithiasis and operations; in the former a resumé of the experiments of various observers as to the part played by micro-organisms in the formation of gall-stones and the work done on their demonstrability by the X-rays are the most noticeable features. The account of the operations is clear and ample, and embodies the results of the author's large experience; in suturing the ducts after choledochotomy he has not found Halstead's hammer to be of much service. An appendix contains all the operations performed by Mr. Mayo Robson; they reach the large number of 539. Some of

the illustrations are good, but many, more particularly those made from museum specimens, are lacking in clearness; with this minor exception we have nothing but praise for the book; it contains all that is at present known on the subject, and should be of use to every practitioner.

Lectures on Clinical Psychiatry.—By DR. EMIL KRAEPELIN—Translated by THOMAS JOHNSTONE, M.D. (Edin.), M.R.C.P. (Lond.) Baillière, Tindall & Cox. Pages xvi and 308. Size Demy 8vo. Price 10/6 net.

A MOST interesting study of mental disease not classified in accordance with superficial resemblances, but so far as possible, by ascertaining the psychical changes which underly the outward manifestations, is set forward in these pages in a manner which holds the interest by its vivid realism. The field of insanity is displayed with considerable completeness in a series of striking descriptions of mentally diseased patients, the prognosis is fully entered into, and the subsequent histories of the patients followed up, sometimes for years after the original lecture in which their peculiarities were described was delivered. Not only are the ordinary types of insanity fully dealt with, but there are equally excellent chapters on delirium and delusions, on epileptic, hysterical, and puerperal insanity, and on the abnormal mental states produced by alcohol, morphia, and cocaine. Omission must not be made of chapters on Paranoia (monomania), and on Morbid Personalities, such as the born criminal, liar, and swindler. The translator is to be congratulated on the skill with which he has carried out his task. There is no constraint in style to serve as a reminder that the work was not written originally in English.

Materia Medica, Pharmacology and Therapeutics—Inorganic substances.—By CHARLES D. F. PHILLIPS, Third edition. Longmans, Green & Co., price 21 shillings. 920 pages.

THIS edition has been so thoroughly revised as to be almost a new book. The volume under review deals with inorganic substances. The wide scope and usefulness of the book can probably be best illustrated by an example. Taking mercury, as such, there are described, firstly, its distribution in nature; secondly, its characters and tests; thirdly, its salts and compounds with the characters and tests of each; fourthly, the mode of absorption and elimination of the metal and its compounds; fifthly, its physiological action in detail for each system; sixthly, its synorgisis; seventhly, its antagonists and incompatibles, including the treatment of mercurial poisoning; eighthly, its therapeutic action in detail, both external in thirty-seven different conditions varying in severity from freckles to epithelioma, and internal in thirty-four, nearly all serious diseases next the method of administration by hypodermic and intermuscular injection, by inunction and by vapour bath; and lastly its preparations and their doses.

Similarly, under the heading of water come the effects of different baths at various temperatures; the ingredients and therapeutic action of the springs of 200 watering places; and curiously enough the effects on the body of air, sun and light, electricity and the Finsen light. The rest of the book is equally thorough, and is completed by an index of diseases and their remedies, including those treated of in the companion volume, which is in the press. By consultation of this index may be learnt the pages at which are described, with constant references to current literature, the various remedies which have proved useful in different hands, in the different stages of the disease upon which information is sought. It will be seen that no pains have been spared to make the book useful from every point of view and that the result has been most successful. In addition to many references to the opinions of others, the large experience of the author permeates and consolidates the whole, making the book one of the most valuable contributions to the subject of therapeutics.

Ophthalmological Anatomy.—With some illustrative cases. By J. HERBERT FISHER, M.B., B.S. (Lond.), F.R.C.S. (Eng.). London. Hodden and Stoughton, 1904. Price 7*s.* 6*d.*

THIS work is the outcome of the author's belief that ophthalmic service is to some extent hindered by the want of a clear anotomical picture in the minds of those who devote themselves to it. As he truly remarks the smaller works on ophthalmology are deficient, and in some cases not always accurate, in the anatomy which they teach; in some of the larger volumes most of the information may be given, but the reader needs much time to waste in collecting it. The present volume remedies these defects and the wonder is that such an excellent book can have been produced in such good style by the publishers for the modest sum charged for it.

The work is divided, as is shown in its title, into two parts. Part I deals with ophthalmological anatomy only and is a clear exposition of our knowledge of the subject. The visual pathways and centres are briefly discussed and the course of the visual impulse is traced from the eye-ball to the cerebral cortex, The centres for ocular movements are defined and then the nuclei, course and distribution of the cranial nerves are followed out. The cervical, sympathetic and ciliary ganglion, and cerebral topography occupy the next two chapters and are illustrated by some useful diagrams. Ocular muscles and their movements, with an explanation of squint and double images, are well described. The author describes Tenon's Capsule differently to other writers. He con-

siders the usual description in which the globe is said to play like a ball in a socket formed of the capsule to be erroneous. The capsule being continuous with the dural sheath of the optic nerve posteriorly and attached anteriorly with the conjunctiva at the sclerocorneal junction, render such a movement impossible. Mr. Fisher regards the globe and capsule as moving harmoniously together upon the retro-ocular tissues. Only by such a movement does he believe that the retinal and choroidal circulations can go on unimpeded in the different positions into which the eye is turned. The last chapters deal with the eyelids and the lachrymal apparatus, 'the ophthalmic blood-vessels and intracranial venous sinuses,' and 'the orbit and its surrounding air-cells.' Some points in development. The second part contains twenty-three illustrative cases of much interest. An account of them here would be out of place, but the cases are well recorded and will repay study. Mr. Fisher is to be congratulated on producing a book of much use to ophthalmic surgeons. The publishers could not have done their work better.

Current Literature.

I.

THE THERAPEUTIC USES OF NORMAL SALINE SOLUTION.

In the *Glasgow Medical Journal* for February 1904 is an article by Dr. W. D'Oyley Grange on "The external and internal uses of normal saline." Having pointed out the enormous physiological difference between plain water and normal saline solution, he considers the question of baths. An ordinary bath results in the necrosis of those cells of the epidermis which have reached the layer in which the cells are hovering between life and death; this in the weak and old produces a certain amount of shock, which, when repeated daily, produces an appreciable result. The acknowledged benefits which result from mineral water baths he belives are largely due to the fact that they approach normal saline in composition, hence they do not produce shock, and in cases of skin disease their cleansing effects can be taken advantage of without any danger of their producing further necrosis in the cells of an a'ready badly nourished epidermis. This is particularly the case in eczema. All our secretions are saline, and were urine plain water micturition would cease to be "one of the few innocent amusements of life," which suggests that, unless incompatible, intra-urethral injections should have normal saline as a basis. Normal saline is a useful diuretic; being rapidly absorbed from the stomach, it should be used instead of plain water for flushing the peritoneum if this a required during operations. A cold morning bath he adds may be continued for some years later than would otherwise be the case, if its composition is that of normal saline. Vaginal douching if, administered with warm normal saline, is much more soothing than if plain water is used, and he has found that some forms of sterility yield to a course of douching with normal saline, a fluid in which spermatozoa live, whereas plain water kills them.

In the *Therapeutic Gazette*, for November 1903 is a review on an article on "The diuretic value of salt-solution enemata, especially after renal operations" by Brown, extracted from the Maryland *Medical Journal* for August. The therapeutic application of the process is based on experiments performed at the John Hopkins Hospital some years earlier, in which in 12 cases saline enemata of 500 cc. were given immediately after the voiding of urine, and it was found that within 4 hours, from a half to four-fifths of the fluid had been excreted by the kidneys. Accordingly he makes it a routine procedure to give pint enemata of normal salt-solution every six, eight or twelve hours after nephrectomy or nephropexy, and indeed in all cases of operation in which ether is given as an anæsthetic. In the former cases the amount of urine passed has been as much as or more than normal and distressing symptoms have been relieved. He has found it useful in a number of medical cases, in which it has been essential to produce diuresis rapidly and effectually.

In the *Medical Chronicle* for February 1904 is an article by Frederic P. Henry, M.D, on "Saline hypodermoclysis in the treatment of pneumonia." He does not publish statistics on the matter, since youth, vigour, and the genius epidemicus make so much difference that one set of statistics is not comparable with another; he relies on a "conviction of its efficiency based upon a more or less continuous employment of it since the year 1889, and the fact that it is now a recognised agent in the treatment of pneumonia ..... It dilutes toxines and favours their elimination; it preserves the alkilinity of the blood, which is one of the most important properties of the vital fluid, and it does so by supplying a defective substance, sodium chloride, and finally it tends to prevent the formation of heart clot, which the writer believes to be a fertile source and cause of death in pneumonia. Theoretically therefore hypodermoclysis is indicated in every case of pneumonia, and practice has convinced me of its efficiency." He has not however used it hitherto in the young and æsthenic. The apparatus used is an aspirator with reversed valves, or a syringe with a hollow needle; this is much less tedious than a funnel and tube.

C. L.

II.

OBSTETRICS AND MIDWIFERY.

Ovarian Pregnancy.

Micholitsch (Centralbe. f. Gynak, Leipzig, 1903, No. 42) reports two cases of ovarian pregnancy occurring in a series of 120 operations for ectopic pregnancy, 1) Patient, *æt* 32, had one previous normal labour. The present specimen was obtained by anterior calpotomy. The swelling was about the size of a small apple and quite distinct from a normal Fallopian tube. Microscopic examination showed villi and amnion in the capsule of ovarian tissue. Inside the capsule there was found a blood-mole containing an empty sac the size of a hazel-nut. (2) Patient *æt.* 23, 1 para, had a left-sided ovarian tumour removed by calpotomy. The corresponding tube was normal. Section of the cyst showed it to be a blood-mole containing an empty amniotic cavity. The capsule was composed of a thin layer of ovarian tissue. Micholitsch offers no theory to explain how the ovum became embedded in ovarian tissue — (*Edin. Medical Journal*, January 1904.)

Vaginal Operations without Narcosis.

Former (Centralbl. f. Gynak, Leipzig, 1903, No. 45) refers to three cases of Vaginal hysterectomy operated on by Gradenovitz (Monatschr. f. Geburtsh, f. Geburtsh u. Gynak, Berlin, Bd. XVII, S. 45) after hypodermic injection of morphine. The only painful process was the ligaturing of the lower part of the broad ligaments and tubes. Fellenberg recommends the avoidance of general anæsthesia in vaginal operations where the patients are old and suffering from organic disease of some important organ. He reports three successful cases: (1) Patient, *æt.* 89, anterior and posterior colporrhaphy with amputation of the cervix; duration of operation, one hour. (2) Patient, *æt.* 34, mitral stenosis, with bronchitis admitted to hospital for

irregular uterine hæmorrhages and prolapse; cureted both cervica llips amputated, and posterior colporrhaphy. (3) Patient, *æt.* 77, senile heart; admitted for carcinoma of fundus uteri, with myoma of the posterior uterine wall. Uterus extirpated, clamps followed by ligature of the broad ligaments being used; duration one hour. In all these cases the patients complained of very little discomfort during the operations. Fellenberg thinks it unnecessary to first inject Schleich's solution into the broad ligaments, and tubes, but has found this useful when injected into the perineum and vulval region prior to operation. He always gives a hypodermic of morphine half an hour before operating. As perforation of the uterine wall by the curette nearly always happens when the patient is under the influence of an anæsthetic. Fellenberg thinks general anæsthesia should be avoided when curetting the uterus.—(*Edin. Medical Journal*, January 1904.)

Excision of the Thyrid during Pregnancy.—Von Fellenberg (*Centralbl., F. Gynak*, Leipzig, 1903, No. 42) after referring to the occurrence of dyspnœa, during pregnancy, as the result of tracheal compression by enlargement of the thyroid, reports two interesting cases where excision of the gland was urgently necessitated—(1) Patient, *æt.* 32, was admitted to hospital on account of dyspnœa associated with great enlargement of the left lobe of the thyroid. She was eight months pregnant. A sudden choking attack with cyanosis demanded immediate tracheotomy This, however, was found impossible on account of the enormous size of the thyroid, which extended down into the thorax. Kocher's incision towards the left side enabled Fellenberg to enucleate the incarcerated left lobe; the right lobe, being only slightly enlarged, was not removed. Convalescence was satisfactory, and the patient was normally confined a month later. (2) Patient, *æt.* 24, one para, admitted with general enlargement of the thyroid, compressing trachea, and causing recurrent attacks of severe dyspnœa. Both lobes were removed, Kocher's incision being used. Recovery satisfactory, normal confinement two days later. Fellenberg considers that removal of the gland was fully justified in those cases on account of the difficulty and possible insufficiency of tracheotomy. To prevent the tendency to tetanic attacks, Fellenberg put the second patient on thyroid treatment, and recommends this as necessary where the whole gland is removed. He refers to a case published by Dienst, where tetany occurred after complete removal of the gland, and where it had not subsequently been given as a remedy. Meinert also reported a case of tetany coming on after partial removal of the gland, the remaining lobe having become atrophied —(*Edin. Med. Journal*, January 1904)

The Bacteriology of the Puerperal Uterus.—Marx (*Amer. Journ Obst.*, N. Y., September 1903) publishes a report on an investigation into the bacteriology of the puerperal uterus. Elaborate aseptic precautions were adopted, and are taken to prevent contamination from vulva, vagina or cervix. Cultures were taken of the lachia in fifteen consecutive cases, at first from six to twelve hours after labour, and then on every alternate day. The cultures in fourteen cases proved negative, in the fifteenth acute sepsis developed. The investigation proves that the puerperal uterus is sterile and if pathological organisms are present they have been introduced by accidental contamination. (*Edin. Med. Journal*, January 1904)

J. W. RAIT.

Correspondence.

WIDOWS' PENSIONS.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—Would you kindly let me know through the medium of the *Gazette* if the widows and children of officers of our service (I. M. S.) are eligible for any pension or compassionate allowance other than those obtainable from the Indian Military Service Family Pension Fund, and, if so, where are the rules with regard to these pensions and compassionate allowances to be obtained. I have before me at the present time a copy of the Royal Warrant, dated 1900, for the pay, appointment, promotion and non-effective pay of the army, but cannot make out from it anything definite on this point.

Yours truly,
I.M.S.

"JAIL STOMATITIS."

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR—I have read, with much interest, the paper entitled "Jail Stomatitis," by Dr. Nobin Chunder Dutt, in your issue of May last, and, as you have invited discussion, I venture to offer a few remarks on the subject, based upon an experience of several jails in the Punjab, during the past five years.

Dr. Dutt describes a variety of conditions of the mouth under the head of stomatitis, and, for the reasons given in his paper, attributes them, shortly, to dyspepsia, due to unsuitable food, and, generally, the same causes that are held responsible for dysentery in jails.

I venture to think this may be a confusion of cause and effect and believe that the stomach and intestinal troubles are the result, to a large extent, of unhealthy conditions of the gums and mouth.

Like Dr. Dutt, I have, more than once found a considerable number of unhealthy gums amongst prisoners on taking over charge of a jail (casually attributed to scurvy by the Hospital Assistant in charge), but have invariably found the condition disappear in a few weeks or days, *and never return* after the issue, and regular use, under supervision, of the "datwan", "miswak," or ordinary tooth-stick in common use amongst the natives of the country, *and without any alteration in the diet whatsoever*. I have found, moreover, that with attention to the cleanliness of the teeth, and the use of sterile sand for the cleaning of feeding vessels, diarrhœa, dysentery and alimentary troubles generally have dropped to a minimum. It would be interesting to know whether tooth-sticks are in use in the Bengal Jails. If not, it would be well worth while making an experiment in their use in a jail subject to the mouth trouble described. So convinced am I of its importance that I inspect the gums and teeth of every prisoner in my jail weekly, in the Monday parades, when the tooth-sticks are paraded with the rest of the prisoners' equipment. A few extra marks are awarded for attention to the details of these parades (not the least of which is the cleanliness of the teeth), and the neglect of them punished, with markedly good results, both as regards health and discipline. Although, perhaps, outside the present subject, I am convinced that the discipline of a jail is, to a very large extent, dependent upon its health; for prisoners, like other human beings, when dyspeptic, or otherwise out of sorts, are liable to take a distorted view of things and become fractious.

The connection between sound gums and teeth and a healthy condition of the alimentary tract generally is obvious. Picture a prisoner without proper means of cleansing his teeth for long periods at a time—the accumulation of tartar, a certain amount of septic material or the *oidium albicans* (the latter especially if the person is debilitated from some exhausting disease, such as malaria, and receiving milk in his diet) are not long in working their effects. The gums and mouth become tender and lead to bolting of the food, followed, in time, by gastric and intestinal derangement, which paves the way for the development of diarrhœa and dysentery. If one believe in the "dyspeptic ulcers" of the mouth (Cheyne and Burgard remark "their exact relation to the stomachic condition is not clear"), it is easy to see how a vicious cycle is established, and the conditions kept going.

The seasonable prevalence of the trouble reported, would appear, at first sight, to negative my theory; but it must be noted that the period mentioned is the hottest and most malarious season of the year, and, consequently, the most depressing and suitable for the development of unhealthy condition in the uncleanly mouth.

I agree with Dr. Dutt that malaria is not directly accountable for the trouble. In conclusion, I think all the facts enumerated at the end of Dr. Dutt's paper can be explained by a want of habitual cleanliness of the teeth. Until, however, one knows whether suitable arrangements existed in the Daltonganj Jail to ensure this, one can only put forward this theory as a possibly correct one.

I notice that along with changes in the jail diet, very elaborate means were taken to treat the local condition without effect, and I am inclined to think, these played no small part in the eradication of the trouble.

LUDHIANA, PUNJAB;
1st July, 1904.

R. HEARD,
Captain, I.M.S.

[We are strongly in favour of the view that much of the "stomatitis" or "gingivitis" is due to want of cleanliness.

We know of many jails in Bengal where this is recognised, and where steps have been taken to enforce cleanliness of the teeth by the issue of tooth-sticks and use of a tooth-powder made of charcoal and powdered burnt-alum. We strongly recommend the use of tooth-sticks. The Indian in free life is careful of his teeth, and every opportunity should be given him in prison to keep up this cleanly practice.—ED., *I. M. G.*

THE DIFFERENTIATION OF HUMAN BLOOD.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—The note on this subject which appeared on p. 195 of our issue for April should be read with the following additional note, which was given by Mark and Ehrnrooth in the *Muenchener med. Wochenschrift*, No. 16 of 1904: The blood-stained cloth, etc., should be, when soaked in the 6 *per mille* (NOT 6 *per cent.*, as, by a printer's omission of the decimal point, our note on p. 195 has it) solution of salt, well squeezed between the blades of a pair of forceps, so that all the blood may be extracted: the older the blood-stain the longer it should be left in the solution—2—3 hours being required for very old specimens—in order that a concentrated "Serum" may be obtained. Further they recommend that only one drop of such a serum be put on the slide, and that on this be superimposed the object glass, on which has been placed quite a small drop of finger-blood; by this means the characteristic reaction is well brought out at the periphery of the preparation, the ghosts of the xanthocytes—the results of hæmotysis—being well seen. With blood of older date than one month the agglutination, or its absence, is well seen, and we may determine whether the blood examined is that of a man, or that of another mammal; but with blood which is fresh one has to contend with a pseudo agglutination such as that which V. Decastello and Sturli have described, in which if the blood is human blood these xanthocytes become arranged in rouleaux, without however, losing their individual identity, or breaking down or becoming decolorised. When one has to deal with such fresh blood, and has any doubt as to the appearances observed being those of agglutination by heterologous, or pseudo-agglutination by homologous blood, one may solve the question by adding to the preparation a drop of one's own serum, prepared as follows:—Two cubic centimetres of a 20-25 *per cent.* solution of the observer's blood in 6 *per mille* salt solution, are left to stand for 24 hours, at the end of which time the upper part of the solution will be quite clear. Of this clear fluid a drop is added to the drop of the "serum" of the blood under examination, and to this mixture is added a drop of the observer's finger blood—as detailed on p. 196; if the blood be heterologous—*i.e.*, of a mammal other than man, its agglutinating power is lessened, or may be entirely destroyed, whereas if it be homologous—human-blood—its pseudo-agglutinating power is much increased. Or to the preparation already freshly made, may be added a drop of the clear fluid, by being run under the cover-glass; when this is done it will be seen that the clumps of xanthocytes become loosened into individual separate cells, if the blood be heterologous, whereas with homologous blood the rouleaux become tightened up as it were.

10th August. W. D. S.

Service Notes.

THE annual dinner of the Indian Medical Service was held at the Café Monico on June 9th under the presidency of Surgeon-General Sir Annesley C. C. De Renzy, K.C.B. In all some 65 members of the service were present and after the usual loyal toasts which were proposed by Sir Annesley De Renzy, the toast of the sister services was given by Colonel W. E. Cates. Sir James Dick, in responding for the Royal Navy Medical Service, pointed out that both naval and military medical officers owed a great debt of gratitude to the Indian Medical Service, seeing that a distinguished member of that service, *viz.*, Sir Ranald Martin, was instrumental in obtaining for medical officers the Order of the Bath in the military division which had hitherto been strictly confined to combatant officers. Surgeon-General A. Keogh, who responded for the Royal Army Medical Corps, referred to the solidarity which distinguishes the Indian Medical Service. The toast of "The Guests" was proposed by Surgeon-General Sir Joseph Fayrer and responded to by Sir Richard Douglas Powell, while the toast of the evening—that of "The Indian Medical Service"—was proposed by Mr. Jonathan Hutchinson who referred in terms of gratitude to the kindliness with which he had been received by the Indian Medical Service during his late tour through India. The toast was acknowledged in a brief speech by Sir Annesley De Renzy. Before the conclusion of the evening Sir Annesley De Renzy paid a warm tribute to the services of Lieutenant-Colonel P. J. Freyer who acted as secretary of the dinner and who, in acknowledging the compliment, referred in very grateful terms to the help given to the Indian Medical Service by *The Lancet* and the *British Medical Journal*. Miss Mary Boyd contributed to the success of a very enjoyable evening by singing various songs.

The following members were present:—

Surgeon-Generals: W. W. Beatson, A. M. Branfoot, C.I.E.; Sir Annesley De Renzy, K.C.B.; Sir J. Fayrer, *Bart.*, K.C.S.I., F.R.S.; C. Sibthorpe, C.B.; and P. W. Sutherland.

Colonels: C.W. Carr-Calthrop, W. E. Cates, W. Gray, D. Erskine Hughes, C. H. Joubert, Sir George King, K.C.I.E., F.R.S.; M. D. Moriarty, G. S. Sutherland, and W. A. S. Wyne.

Lieutenants-Colonels: J. Anderson, M. L. Bartholomeusz, S. Bigger, R. H. Charles, A. Crombie, C.B.; E. F. Drake-Brockman, A. O. Evans, P. J. Freyer, T. Grainger, P. de H. Haig, I. B. Lyon, C.I.E.; R. W. S. Lyons, C. P. Lukis, D. P. MacDonald, J. Moorhead, T. R. Mulroney, Duff-Mullen, P. F. O'Connor, C.B.; W. A. Sykes, W. H. Thornhill, and J. F. Tuohy.

Majors: A. Buchanan, W. S. Caldwell, F. Carter, G. A. W. Hall, C. Herbert, C. Mactaggart, R. C. MacWatt, J. Penny, W. H. B. Robinson, R. Ross, C.B., F.R.S.; and S. Browning Smith.

Captains: H. Burden, E. M. Illington, F. O. N. Mell, A. E. Hayward Pinch, and C. E. Williams.

Lieutenant: F. W. Sumner.

The guests were: Sir Richard Douglas Powell, *Bart.*, K.C.V.O., President of the Royal Medical and Chirurgical Society; Inspector-General Sir James Dick, K.C.B., R.N.; Surgeon-General A. Keogh, C.B., Deputy Director-General, A. M. S.; Mr. Jonathan Hutchinson, F.R.S.; Dr. de Havilland Hall, President of the Medical Society; Dr. H. P. Cholmeley, representing *The Lancet*; and Mr. Eastes, representing the *British Medical Journal*.

MAJOR C. GILBERT, I.M.S., made over charge of the duties of Superintendent, Abbottabad Jail, to Captain T. A. Grainger, I.M.S.

CAPTAIN COX, I.M.S., took charge of the civil medical duties of Mardan subdivision on 2nd June, relieving Captain H. M. Cruddas, I.M.S.

MAJOR E. McK. WILLIAMS, R.A.M.C., has exchanged places on the Indian roster with Captain F. G. Faichnie, R.A.M.C.

CAPTAIN W. R. BATTYE, I.M.S., Residency Surgeon at Gwalior, was granted privilege leave from 7th July 1904.

CAPTAIN H. KIRKPATRICK, I.M.S., was due to return from six months' leave on 19th August 1904.

CAPTAIN C. HUDSON, I.M.S., gets six months' leave including 90 days' special Somaliland leave.

LIEUTENANT BERNARDO, I.M.S., has got 90 days' special Somaliland leave.

ACCORDING to India Army Order 431, dated 14th June 1904, the most important changes in I. A. R., Vol. VI., Medical, are shown below:—

"*Paras.* 20 *and* 25.—Senior medical officers of stations have been vested with power to attest men of the Army Hospital and Army Bearer Corps.

Para. 24.—In districts and stations companies of the Army Bearer Corps will be subject to the control of the district principal medical officer and senior medical officer of the station respectively.

Para. 29.—The temporary employment of extra matrons will in future be sanctioned by competent financial authority.

Para. 33.—The employment of temporary hospital servants will in future be sanctioned by competent financial authority.

Para. 38.—The senior medical officer will in future be regraded as an officer of the station staff.

Para. 54.—The strength of the medical establishment to accompany troops moving will in future be decided locally according to the circumstances of the movement.

Para. 83.—The senior medical officer of the station will in future be responsible that all necessary instructions as to the measures to be adopted on an outbreak of infectious or contagious disease are communicated to those concerned and carried out.

Paras. 105-109.—The regulations for cantonment hospitals have been embodied in this volume.

Para. 130.—In future unauthorized articles of equipment may only be retained with the sanction of the Lieutenant-General Commanding.

Appendix II.—Assistant-surgeons and hospital assistants will no longer be attested, but will have to sign the prescribed declaration before admission into the service.

CAPTAIN N. R. J. RAINIER, I.M.S., is granted under Article 698, A. R. I., Vol. I., Part I, an extension of leave

from 9th to 13th November 1903, during which period he overstayed the medical leave granted him.

CAPTAIN C. M. GOODBODY, I.M.S., officiates as Superintendent, Central Jail, Lucknow.

CAPTAIN C. MILNE, I.M.S., was placed on visiting medical charge of the Sultanpore district.

THE services of Lieutenant J. E. Clement, I.M.S., were replaced at the disposal of the Government of India.

CAPTAIN T. HUNTER, I.M.S., Civil Surgeon, Farrukhabad, is granted three months' privilege leave.

MAJOR W. T. MOULD, R.A.M.C., was to hold medical charge of Farrukhabad, during the absence on leave of Captain T. Hunter.

CONSEQUENT on the deputation of Lieutenant-Colonel C. G. Manifold, I.M.S., Captain W. Selby, D.S.O., I.M.S., is appointed to be a Civil Surgeon, 2nd Class, and Captain W. H. Orr, a Civil Surgeon, 2nd Class, *sub. pro tem.*, in the United Provinces.

CONFIDENTIAL Reports on officers of Royal Army Medical Corps and Indian Medical Service must in future reach Command Head-Quarters by 10th February at latest; and great care should be exercised in scrutinising them before they are despatched.

THE following are the code telegraphic addresses of the following officers, Military Department:—

Director-General, I.M.S.—Supersunto.
P. M. O., H. M.'s Forces, India—Nefandio.
P. M. O., Punjab ..Penteado.
,, Bengal...Octogeni.
,, Bombay...Spugnosito.
,, Madras...Refutanto.
,, Burma ..Disquiro.
,, of a military district...Domisco.
Senior Medical officer at...Docto.

LIEUTENANT-COLONEL J. W. RODGERS, I.M.S., took over civil medical charge of Kohat on 11th June.

LIEUTENANT J. WOODS, I.M.S., took over the civil medical charge of Bannu on 14th June.

CAPTAIN M. H. THORNLEY, I.M.S., has passed in Bengali by the colloquial test.

CAPTAIN CLAYTON-LANE, I.M.S., was allowed six weeks' privilege leave from 18th July.

CAPTAIN S. H. BURNETT, I.M.S., is appointed Civil Surgeon of Karwar.

CAPTAIN T. S. NOVIS, I.M.S., acts as Resident Surgeon, St. George's Hospital, Bombay.

CAPTAIN L. J. M. DEAS, I.M.S., took charge of the civil medical duties of Kohat, from Lieutenant-Colonel Rodgers on 20th June.

MAJOR C. T. HUDSON, M.B., I.M.S., took over charge of the Bijapur Prison on 25th June.

MAJOR H. J. DYSON, I.M.S., F.R.C.S., is appointed a Civil Surgeon, 1st Class, and posted to Bhagalpur.

CAPTAIN M. H. THORNLEY, I.M.S., is appointed Civil Surgeon of Rangpur.

THE services of Lieutenant W. D. Ritchie, I.M.S., are placed temporarily at the disposal of Assam.

LIEUTENANT-COLONEL D. St. J. GRANT, I.M.S., has been granted six months' leave from 10th July.

CAPTAIN J. A. BLACK, I.M.S., acts as Chemical Examiner to Government, Bengal, till the return of Major C. H. Bedford, I.M.S., in the end of October next.

AN American contemporary says that in the American Army officers get increment of pay every ten years; this increment is called a "fogy," hence the expression an "old fogy."

WE understand that the much-needed reform in the equipment of Military hospitals and of field hospitals in India will be provided for in the Budget of 1906.

LIEUTENANT-COLONEL R. D. MURRAY, I.M.S., has gone as P. M. O. to the Lahore District.

CAPTAIN J. H. HULBERT, M.B., I.M.S., is posted to the United Provinces for civil employ.

CAPTAIN J. W. GRANT, I.M.S., acted as Political Agent in Bhopal from 10th to 18th June inclusive.

CAPTAIN F. A. SMITH, I.M.S., acted as Political Agent in Alwar from 20th May to 22nd June 1904.

CAPTAIN P. P. KILKELLY, I.M.S., was appointed to act as Political Agent in Bikanir till further orders on 22nd June 1904.

LIEUTENANT B. WILLIAMS, I.M.S., acted as Residency Surgeon at Baghdad pending the arrival of Lieutenant C. B. McConaghy, I.M.S., on 30th June 1904.

CAPTAIN W. E. SCOTT-MONCRIEFF, I.M.S., is posted as Agency Surgeon at Bikanir temporarily.

COLONEL HENRY HAMILTON, I.M.S., was made a C. B. in the *Birthday Gazette*, London, June 24th, 1904.

THE Simla Dinner to Sir Benj. Franklin was well attended and was a great success.

COLONEL BOMFORD, I.M.S., C.I.E., M.D., has been appointed to act as Director-General, I.M.S., *vice* Sir Benjamin Franklin gone on 3 months' privilege leave, Lieutenant-Colonel T. E. L. Bate, I.M.S., C.I.E., acts as I. G. of Civil Hospitals and Major R. J. Macnamara, I.M.S., as I. G. of Prisons, Punjab.

THERAPEUTIC NOTES AND PREPARATIONS.

Messrs. Burrough, Wellcome & Co., have sent us specimens of their IRON AND STRYCHNINE tabloids. They are sugar-coated and contain one grain of Phosphate of Iron and one-thirty-second of a grain of the Phosphate of Strychine.

FERRIS & CO., the well-known Druggists and Surgical instrument makers, of Bristol, have issued a Catalogue which is well worth the attention of Medical Officers.

Martindale's Lang's OPHTHALMIC BOTTLES are well worth the attention of Civil Surgeons.

The CHLORIDE OF LIME in a fresh condition, referred to in Mr. Hankin's report, which we quote above (p. 351), can be obtained from Messrs. D. Waldie & Co., 1, New China Bazar Street, Calcutta.

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will **receive 25 Reprints gratis**, if requested.

Communications on Editorial Matters, **Articles, Letters and Books for Review** should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscriptions to the Indian Medical Gazette, Rs. 12, *including postage, in India. Rs.* 14, *including postage abroad.*

BOOKS, REPORTS, &c., RECEIVED.

Diseases of Stomach, Mayo Robson and Maynihan, 2nd Ed. (Baillière, Tindall & Cox.)
Practical Medical Electricity. Dawson Turner, 4th Ed. (Baillière, Tindall & Cox.)
Banks' Insects of the Cacao; (Manilla Bulletin No. 1.)
The Antiseptic, a new monthly Journal.
Indian Public Health, a new Journal.
Texas Fever in the Far East (Bulletin No. 2 Manilla.)
Our National Recreation Parks. N. Penn.
Malaya Branch, B.M.A. Transactions.
Assam Sanitary Report,
Bengal Sanitary Report.

ACKNOWLEDGMENTS, COMMUNICATIONS RECEIVED.

Dr. Newell, Calcutta; Major W. Jennings, Bombay; Major H. Smith, Jullundar; Major Owen Thurston, Calcutta; Major Maynard, I.M.S., Jullundar; Capt. Heard, I.M.S., Ludiana; Dr. H. C. Gupta, Dinajpore; Major Donovan, Madras; Capt. L. Rogers, Calcutta.

Original Articles.

THE USE OF IZAL IN THE TREATMENT OF TROPICAL DYSENTERY.

By J. C. S. VAUGHAN, M.B., C.M. (Edin.),
Major, I.M.S.

The remarkable properties possessed by izal by virtue of which we have in this substance a low toxic value combined with marked germicidal powers, and the results of recent research with regard to its pharmacology and its value as an antiseptic *in vivo* when administered by mouth have induced me to make a trial of this substance in the treatment of tropical dysentery. I am aware that it has been already used in the treatment of this disease, but I do not know of any published results of its use in India in this connection. Before introducing my subject proper, I would venture shortly to sum up what we know of izal itself. Izal oil is a proprietary article discovered by Mr. J. H. Worrall among the by-products occurring during the conversion of coal into coke. Chemically it consists of hydrocarbons oxidized, and having a higher proportion of hydrogen to carbon than the phenol (C_6H_6O) group and a lower proportion than the methyl alcohol (CH_4O) group. It has a high boiling point and is insoluble in water. Three preparations are met with in Europe: (1) the pure (?) izal oil; (2) "medical izal," which is an emulsion containing 40 % of izal oil, and (3) disinfectant izal which, like the medical izal, is an emulsion containing 40% of izal oil, but the latter is not specially refined as it is for the preparation of the "medical izal." Nevertheless this want of refining does not make the disinfectant emulsion unfit for medicinal uses as the sequel will shew.

The germicidal properties of izal were worked out by Dr. Klein in his "Report on the Disinfecting properties of Izal", and a solution of 1 in 200 is quite strong enough for the most antiseptic purposes, while a strength of 1 in 500 has been found by Major F. J. Drury, I.M.S., to be enough to destroy the plague bacillus. As compared with carbolic acid, its germicidal power is much higher, being four times as great while its toxicity is about $\frac{1}{12}$ or less of that of carbolic acid.

Its effects on the living organism have been worked out by Tuncliffe. To sum up his results—(1) To invertebrates izal is rapidly fatal in very great dilution [1cc. of 1% solution to 100 cc. of tap water]; (2) On the frog's heart or on muscle-nerve preparations from the same animal it has a marked action and when given in relatively large doses it destroys the functions of the medulla and spinal cord; (3) On mammals its action was tested in guinea-pigs, rabbits, cats and dogs. Rabbits were found least, and cats most susceptible to its action. Doses of from 0·2c.c. to 0·8c.c. per kilo of body weight produced absolutely no symptoms, and it can be injected under the skin in doses of 0·1c.c. and into the blood in doses of 0·02 cc. in the form of a ½ per cent. or 1 per cent. solution without producing any toxic effects. Large doses taken into the stomach pass down the alimentary tract, and evidence of the presence of the drug practically as izal unchanged can be found in the fæces, while at the same time appetite is unaffected, and there is no evidence of any irritant effect on the alimentary tract. This substance further appears to be by the respiratory organs, for the breath smells excreted of it, while on *post-mortem* examination the lungs smell of it, but not the kidneys or liver or other vascular organs. Hence izal appears to be excreted as izal unchanged by the respiratory organs. On the circulatory system it appears to have no action beyond inducing, when given in large doses, a slight temporary fall in blood pressure. If the dosage be increased beyond o. 25 c.c. per kilo of body weight and administered without break for several days, a definite train of symptoms occurs, *viz.*, restlessness soon followed by inco-ordination of movement. Next by twitching of the limbs especially in any attempt to perform a co-ordinated act. Next follows a spastic gait. If no larger dose be given, these symptoms pass off. If, however, the dosage be increased to 0·5 or 1·0cc. per kilo of body weight, a stage of paralysis supervenes, varying in degree with the dosage adopted. The sensory part of the reflex are remaining practically unaffected, the temperature falls and death occurs from paralysis of the respiration, the heart continuing to beat for some considerable time; after the respiratory movements have ceased the paralytic stage is sometimes absent, and animals can recover even after the paralytic stage has supervened. The action of the drug is somewhat cumulative. Dr. Tuncliffe goes on to say, that judging from the above, it is obvious that the doses required to produce toxic symptoms are much larger than and far in excess of those required to produce the ordinary therapeutic effects of izal, and that when administered to man izal may be given "in doses of from m.xv to ʒi or more of the emulsion, made into an ordinary ounce or half ounce mixture or diluted with milk or water, three or four times a day. If prolonged treatment is desired as for instance in cases of obstinate fœtid diarrhœa or auto-intoxication, a day's pause should be allowed at first after from ʒiv to ʒvi have been administered, to avoid the possible accumulation of izal in the system."

So much then for the general action of izal on the organism. Next I would invite attention to its antiseptic properties as they are exerted *in vivo* when administered by the mouth.

and more especially on the contents of the alimentary tract.

In this connection among the most recently published work are the experiments of Dr. M. H. Gordon [*Lancet*, March 8th, 1902]. To quote his own words Dr. Gordon proceeded to enquire whether "the number of micro-organisms in the fæces is diminished when izal is taken by the mouth and, if so, to what extent," and this enquiry was undertaken in connection with a comparative investigation into the relative merits of various antiseptics when administered in *vitro*. In his experiments the pure izal oil was administered in capsules, each containing m. 2 of the oil. These were given with food, "one capsule before and one or two after the meal according to its size" and the largest amount given in 24 hours, was m. 24 of the oil, no unpleasant symptoms resulting. In the details of these experiments I must refer the reader to the paper already quoted; for my own purposes I shall summarize Dr. Gordon's results as follows :—

Summary of Gordon's experiment.

No. of Experiment.	Experiment No. 1.		Experiment No. 2.		Experiment No. 3.	
Conditions after.	Izal oil, 20 m.	Izal oil, 42 m.	Izal oil, 50 m.	Izal oil, 78 m.	32 hours without Izal.	Izal oil, 36 minims.
Time since experiment began ...	24 hours	48 hours	48 hours	Sixth day	Eighth day	Fourth day
Motion since experiment began ...	Third	Fifth	Second	Sixth	Ninth	Fourth
Reduction of organisms at 37° C. on agar	68 %	86 %	*Nil*; increase of 24 %	90 %	Increase 300 %	60 %
Reduction of organisms at 22° C. on agar	73 %	78 %	10 %	91 %	Increase, 200 %	40 %

Experiments 1 and 2 were made on the same subject, a pause of ten days being allowed between the end of experiment, 1 and the beginning of experiment 2, and experiment 3 was tried on another subject. Both subjects were normal adult males.

In experiment 2 no reduction but an actual increase of blood heat organisms was noted, but this was only the second motion after the experiment began; later on in the same case after the aggregate administration of izal had by the sixth day reached a total of 78 minims, the reduction in micro-organisms was very marked. In this same experiment, further, by the eight day and the ninth motion there was, 32 hours after stoppage of izal, an increase of no less than 300% of blood-heat organisms and 200% of others, on the amount to which they had been reduced to by the izal taken. These figures speak for themselves and shew clearly how very great is the resulting reduction of micro-organisms in the intestine consequent on the administration of izal by the mouth, and in this connection let me point out that a reduction of 90% of blood-heat organisms was effected by 78 minims of izal oil in six days, which means a daily average dosage of m. 13 per diem of pure oil or say an equivalent of 33·5, or say 34 minims of either form of izal emulsion per diem, or, rougly speaking, doses of some 17 m. of izal emulsion given twice, or say11 or 12 minims three times a day, which is just about the minimum dosage noted by Tuncliffe as based in his research already quoted.

Thus far I have been directing attention to the properties and qualities of izal, and I must apologize for the amount of detail given, but I wish to emphasize certain points, *viz.* (1) the extremely large dosage required to produce any physiological effects; (2) the remarkable demonstration of germicidal power when given *in vivo*.

Next as to dysentery. Broadly speaking and for practical purposes, we may regard it as a specific inflammation of the gut, always associated with the presence of a specific responsible virus which is a micro-organism and, added this, we have the circumstance that the ulcers and sloughs caused by the primary virus of dysentery are invaded by other microbes present in the intestine promoting putrefaction in inside the intestine and aggravating the patient's general condition. Johnson, writing in 1818, says truly—Nature, to say the truth, is but a sorry Physician in dysentery. *In hoc enim corporis affectu aliquod certe in medicina opus est, haud. multum in naturæ beneficio*, and that the "opus in medicina" has been recognized is abundantly shewn in the history of the treatment of this condition ever since Johnson's time. Quite recently izal has been used in this connection. Its properties, as above noted, render it peculiarly suitable for use as an intestinal antiseptic, but its scope and value as such can only be tested clinically, and I trust the record given in this communication may prove useful.

In the table appended I have summarized the results of treatment of 242 cases, all treated in the Police Hospital in Calcutta. Besides these there were three others admitted to hospital which died, making in all 245 hospital cases with three deaths. These three last were all of the severest possible type, and one died within 24

hours of admission, and their detail would scarcely alter the figures in the table. Besides these 245, my experience of izal in dysentery covers another 200 cases and more, making in all about 445 cases, but I regret the figures for the 200 odd last referred to are not obtainable as they are mostly cases occurring in practice, but there was not a single death among them. In further explanation of the table I may say that in the matter of arranging the cases, I have adopted a classification necessarily arbitrary, but based purely on a clinical appreciation of the gravity of certain symptoms or groups of symptoms. Thus of the three groups in the table, Type I is what is usually regarded by practitioners as mild, and of this class of cases the main feature is that there is only moderate, or at any rate no great, prostration, and no marked fever, although there may be considerable abdominal pain and tenesmus. The stools in this type are for the most part diarrhœic at first, but soon assume a distinct dysenteric character. Attacks of this kind are sometimes first attacks or instances of mild degrees of recurrence of the disease and usually yield to appropriate treatment.

II. The second type is one usually at once recognized as distinctly severe, and of which the main features are a sharp or fairly sharp onset, often ushered in by a sharp rise of temperature. Systemic depression and prostration are well marked and characteristic, and the stools, though the first few may be mainly or entirely diarrhœic, rapidly assume marked dysenteric characters and very often for a variable time consist of nothing but mucus and blood, the latter varying in amount, from being only enough to give the mucus a rosy tint to being present in large clots, while shreds of necrosed mucous membrane are passed in varying quantities. Obviously a large area of bowel is affected, and as much as from 18 to 20 oz. of typically dysenteric discharges *apart from fæces* may be passed in the 24 hours. The abdominal symptoms are very distressing and acute, and this type of case not infrequently ends fatally or passes into a chronic condition, and is responsible for a large number of men being either invalided from the services or sent home on sick leave. From the first type of mild case this type is at once distinct, not pathologically, but in its degree of severity.

III. The third type is one which, when it occurs, is at once from the outset unmistakeably a most grave and dangerous one. The acute symptoms supervene as a hurricane, and a fatal ending may ensue in from 48 to 72 hours, the bowel *post-mortem* shewing an uninterrupted or scarcely interrupted mass of ulceration and acute inflammation of even the entire large intestine from cæcum to anus. Such cases are usually ushered in by sharp fever, sometimes by a rigor, often followed by a fall in temperature. From the very first blood is passed in large quantities mixed or unmixed with mucus, and shreds of necrosed mucous membrane occur in the discharges very early, and these last, at first very small, appear later in large pieces.

In one of these cases—and fortunately he was one that recovered—I measured the discharges passed between 3 P.M. and 9 P.M. of the same day, and found that in these six hours he had passed no less than 28 oz. of almost entirely blood and mucus with scarcely any fæcal matter, and needless to say, in that period he was thoroughly collapsed. Indeed, it is characteristic that systemic depression and prostration in all of this type of cases are profound. Fortunately even among such cases recoveries are not uncommon, but clearly from the outset, prognosis can only be uncertain, guarded and grave.

It will be at once seen that in presenting these three clinical types there is no attempt at any differentiation into pathological groups or varieties, but only a more or less arbitrary division into groups according to degrees of severity, and to shew the various kinds of cases which have been treated with izal, and the results. The grouping was done after the cases had left hospital, that is, when one was fully able to review their character as a whole and, as far as is possible, the grouping of cases for the table follows faithfully the types outlined in the above remarks.

A further word of explanation is necessary. The period noted for the disappearance finally of blood and mucus from the stools includes the last days when their presence was noted even in the smallest visible quantity, and often enough there was scarcely any to speak of for a day or two or three days, before in some cases they finally disappeared. The maximum period for their disappearance noted under type II is entered as 22 and 42 days respectively. This is absolutely correct, but it occurred in a man who persistently broke hospital rules as to diet, and in whose bedding we repeatedly found parched pulse, salt, lemons and chillies (all of which are often eaten together) and whose fæces repeatedly shewed the undigested remains of parched pulse and peas. Naturally he suffered from relapses and of course spoiled the average, and he was by no means the only man who did so. Indeed, this smuggling in of forbidden articles of diet was not infrequently a course of trouble. It is, however, significant that in the detailed records of cases of the second type, which are too long for publication, the next longest case shews 22 days' duration of mucus, and he also was an offender as regards diet. And a comparison of the figures in columns 2, 5 and 8 with those in 4, 7 and 10, especially in the first two types of cases, will shew that the maximum figures can only be referred to a few exceptional cases, and these were undoubtedly mostly like the two above quoted—offenders as regard diet. The period of establishing of healthy stool characters refers *to the time from which normal formed stools came to be the rule.* In some cases, after

the disappearance of dysenteric characters, stools were semi-solid or thin for a day or two, and then ceased for a day or two altogether, and then healthy stools followed. The whole of such periods are included in column 10.

The usual course taken by cases treated with izal was much as follows: Blood usually disappeared rapidly, and very often never reappeared after 24 hours' treatment, more often the decrease was very rapid within the first 24 or 48 hours, and after that only very small amounts were passed. In a few cases there was scarcely any diminution in the amount of blood passed—even when in fairly large amount, for the first 24 hours, but after that it rapidly decreased, and in some of these instances was reduced on the second or third day to about a tenth part of what it was on the first day. Usually it disappeared before the mucus did. In a few cases where the last days of dysentery shewed but very small amounts of both, it disappeared with the mucus and at the same time. Mucus usually followed the same course. When blood ceased very early, mucus sometimes was passed in very large quantities as clear jelly-like matter, often several ounces in the day and often unmixed with fæces. Fæces, after the typical dysenteric discharges were no longer in evidence, were often thin or semi solid for anything up to three or four days before they were fully formed, and were sometimes fully formed at once on blood and mucus disappearing, or even for a day or two before these latter finally disappeared.

Next as to the detail of treatment. The diet was as is usually prescribed in dysentery, but I preferred a plain meat broth (not jugged) to milk where the patient's caste prejudices permitted, and I used Mellin's Food largely, and I was always satisfied with the result.

Lastly, as to the use of izal. Most officers of the I. M. S. will remember a circular issued in 1901 asking us to make a trial of izal in dysentery and recommending a dose of m. 3 thrice daily or so in adults. This dosage proved to be absolutely useless or nearly so, and this has also been the experience of most officers of the I. M. S., to whom I have spoken on the subject. Arguing from the facts noted in the earlier part of this paper, I pushed izal considerably. I had adopted three standards of dosage in treating the above cases, *viz.*, preparations containing ʒiss, ʒii and ʒiiiss of izal emulsion in the eight-ounce mixture of eight doses, averaging thus, 10½, 15 and 26¼ minims of izal emulsion per dose respectively. Of these the last two were the most serviceable. Doses were given about every three hours while awake, thus averaging, say, six doses from 6 A.M. to 9 P.M., and usually a seventh dose about midnight. The mixture may be made up to suit the taste, and usually chloric ether, tinct. cardam. co. and glycerine combined make a good vehicle, diluted suitably with water. Another good combination is with spt. chloroformi, syrup of tolu, glycerine and ether cinnamon, ol. anethi or peppermint. Some patients prefer diluting the mixture with milk.

In seven cases, especially where abdominal pain and tenesmus were very distressing, opium stupes to the abdomen or morphia by mouth or preferably hypodermically—or laudanum by the mouth were resorted to, but opiates were sparingly used, the idea being to use them only enough to allay pain and to allow the

Table classifying results of treatment of Dysentery with Izal.

Type of Case.	Number of days taken from commencement of izal treatment for fæces to be finally free of dysenteric characters.						Number of days taken from commencement of izal treatment to establishing of healthy character of stools.		
	Free from Blood.			Free from mucus, shreds of slough of mucous membrane, &c.					
	Maximum number of days.	Minimum number of days.	Average number of days.	Maximum number of days.	Minimum number of days.	Average number of days.	Maximum number of days.	Minimum number of days.	Average number of days.
Columns 1	2	3	4	5	6	7	8	9	10
Type No. I.									
145 Cases	8	1	1·64	10	1	3·18	19	2	4·55
Type No. II.									
87 Severe cases	22	1	4·31	42	3	6·65	48	4	8·60
Type No. III.									
0 Extremely severe cases	16	3	7·40	22	7	8·80	23	8	13·30
Averages of above.									
242 Cases in one series	22	1	2·83	42	1	4·66	48	2	6·35

bowel a little rest and to give the izal opportunity to exert its germicidal powers in *vitro* and then trust to natural healing in the gut.

In many cases in which very satisfactory results followed, the fæces smelt of izal, and in at least one such case izal was passed apparently unchanged through the bowel.

In conclusion, I may say that in dysentery of the very worst as well as of the milder types I have found this drug *facile princeps* the most reliable remedy, but I cannot too strongly insist on the fact that small doses are useless, and the drug must be pushed to doses of the kind recommended. It is quite useless to play about with doses of three to five minims. I have two or three times been pulled up by dispensing chemists, and once by a well-known European firm, and my dosage criticized and objected to, and one of my assistants who had the temerity to follow my example and prescribe doses of m. 15, was once promptly ordered out of a chemist's establishment in Calcutta, and his prescription was rejected by the dispenser who flatly refused to make it up for him.

One more point. The disinfectant preparation of izal sold in the markets is quite as effective for treatment of dysentery as the "medical" izal, and I have used it for over a hundred cases, the "medical" izal being not procurable in time. It is a little more inclined to produce a hot sensation in the mouth than the medical izal, and requires more careful combination in prescibing so as to cover the taste.

This paper deals only with dysentery, but I may add that I have used izal with success in diarrhœas of various kinds, and in fœtid discharges from the bowel in various conditions, in cholera and in acute croupous pneumonia These last I hope to make the subject of a future note. Finally I must express my obligations to Assistant-Surgeon Bepin Bihari Sen Gupta and to Hospital Assistant Girish Chandra Bagchi for their very painstaking assistance in the trial of Izal, on which this communication has been based.

NOTES ON SOME CASES OF FROST-BITE.

By F. POWELL CONNOR, F.R.C.S.,

LIEUT., I.M.S.

In a recent number of the *Indian Medical Gazette* (July, 1904) there appeared some observations on "Frost-bite in the Tibet Mission Force." We can derive from it considerable information as regards the ætiology and immediate treatment of such cases. Several patients representing a more chronic and advanced stage have been handed on to the Depôt Hospital of the 8th Gurkha Rifles at Shillong under my charge. A few words dealing with my experience of the treatment of such cases may not be amiss.

These cases came under the two headings of moist and dry gangrene, affecting generally the fingers and toes, but sometimes half the foot, etc. Damp and wet clothing—as pointed out in the article abovementioned—was a predominant predisposing factor in their causation.

The cases of lesser severity involving fingers and toes, etc., only came under the heading of dry gangrene. The striking point in these was the importance of conservative surgery in the first instance. For, oftener than not they appeared more serious at first sight than was actually the case. Looking at such cases—I speak only of such as have come under my care weeks or months after being frost-bitten—the blackening of the skin may be found to extend much further back than the actual death of the part as regards its deeper and more important elements. In other words, much of the apparent gangrene involves merely the epidermis and therefore can be neglected. If operative treatment is precipitate more of the limb would be sacrificed than is justified by the condition of the parts.

Another point of importance, which bears on the operative treatment, is the excellent vitality of the adjacent tissues. This is to be expected considering the fact that the chronic inflammation of the part produces hypervascularity and therefore an increased power of healing. One is apt from text-book ideas, which are often so hard to shake off, to think of the process of gangrene as death of a part with much adjacent lowering of vitality. This is certainly so in the ordinary types of gangrene, for such depend essentially on gradual vascular degeneration. In frost-bite the case is entirely different—a part is struck dead, but the adjacent tissues after recovering from the first shock acquire if anything greater vitality, resenting as they do the presence of the neighbouring dead tissues. This fact is of obvious importance when performing an amputation. Much of the blackened parts can be spared, as it is only epidermis-deep, and the rest of the flap beneath it is of excellent quality.

Antisepsis here as in all branches of surgery occupies a prominent place, and it is a fortunate circumstance that in these cases it is comparatively easily attained. Every Surgeon knows how difficult it is to get healing by first intention in operations where chronic suppuration has been going on for some time. Yet, my experience has been much more favourable in dealing with this class of cases, because the suppuration is of a very inactive form (especially in dry gangrene), and because of the excellent vitality of the flaps. Thorough scraping of the wound, after removing all the obviously dead tissues, combined with the use of plenty of strong antiseptic such as 1 in 3000 Hydrarg. Perchlor. must be carried out. All dead bone should be carefully removed, if possible as far as the nearest healthy joint, and even the blackened epidermis carefully scraped throughout its extent. By employing this technique I obtained primary union in all cases—even some of moist gangrene.

A troublesome condition in the after-treatment of the stumps, particularly in the case of the fingers, is the persistent stiffness of the adjacent joints and a marked lowering of tactile sensibility in the neighbourhood of the blackened epidermis. This condition markedly improves with treatment after some time. Daily massage with friction, combined with the application of warm water is all that is required.

Exposed as our Indian Army is to frontier warfare often in the coldest of climes, it behoves the Military Surgeon to interest himself in the subject of frost-bite. It is hoped that these brief notes, dealing with some of the points in the after-treatment, may be a slight addition to the valuable information derived by those now with the force engaged on active service in Tibet.

ULTRA VIOLET RAYS.

By E. C. MACLEOD,

CAPTAIN, I.M.S.

This subject, which as a therapeutic agent has attracted much attention in England and on the continent, does not appear, in India, to have received the consideration which might be expected from a form of rational treatment in which the sun is so important a factor, and provides an almost constant supply of "force." In order that the principle on which this method of treatment is based may be clearly understood, I may be excused if I here mention that the solar spectrum in its entirety, may be considered to consists of three parts.

1. The Ultra Violet Rays.
2. The Luminous Rays, or those visible in the Spectrum.
3. The Ultra Red Rays.

1. The Ultra Violet Rays sometimes spoken of as "Chemical" or "Actinic" are not ordinarily visible in the Spectrum, but their existence can be demonstrated by means of a quartz prism, the bright part of the spectrum being shut off.

2. The Luminous or Rays visible in the spectrum are, it will be remembered,

Violet.	Green.
Indigo.	Yellow.
Blue.	Orange.

Red.

These before dispersion form white light.

3. The Ultra Red or Heat Rays are also invisible, but can be demonstrated by means of a thermophile and galvanometer. It is familiar to all that if the sun's rays be *concentrated* on to the surface of the body by means of a convex lens or concave mirror, the result, if the experiment can be carried on long enough, is immediately a more or less severe burn.

If, however, the Red and Ultra Red or Heat rays are absorbed by passing them through a sufficient depth of cold water or a medium coloured blue, *e.g.*, blue glass, water coloured blue, it will be found that the heat rays have to a certain extent been absorbed, and if the absorption is complete no burning takes place when the sun's rays are concentrated on the skin.

For practical purposes water coloured by the addition of methylene blue or sulphate of copper has been found to be a satisfactory medium for absorbing the heat rays, whilst at the same time it allows the Ultra Violet or Chemical Rays to pass through, as a familiar instance of how the Ultra Violet or Chemical Rays may be excluded, the method adopted by the photographer in his dark room, by the intervention of red glass between the light and his plates, may be quoted.

On the principles given above, and on observations based on his own and the experiments of other, some of which are mentioned below, Finsen in 1893 introduced his sun treatment of Lupus by "concentrated Ultra Violet Rays." This treatment which appears to have been attended with good results was not always practicable, and gave place to treatment by electric light installations which can be seen at the London Hospital and at the Broca Hospital in Paris.

It is generally known that light, particularly sunlight, exerts a deleterious and sometimes fatal effect on many of the lower forms of vegetable life and especially on bacteria, as examples of which may be mentioned B. Anthracis, B. Typhosus and the cholera vibrio.

Professor Finsen states that D'Arsonval and Charrin in the *Semaine Medicale*, 1894, p. 26, have shown that it is the chemical rays only which have a destructive influence on the Pyocyaneus. Graber and Dubois experimenting on earthworms and Proteus (a batrachian) found that the comfort of these animals decreased in proportion as they were exposed to red, yellow, green, violet, blue, and white light, the Ultra Violet Rays appear to exert the same effect as white light, whilst the effect of red light is said to be equivalent to darkness.

In the case of the Chameleon, Brücke and others have shown that the portion of its body exposed to light passed through red glass retains for a long time its normal colour, whilst the portion exposed under a blue glass to a blue light becomes instantly blackish. The chameleon moving its pigment cells to remove the disagreeable impression conveyed by the blue light.

Of the baneful influence of light, other than red light, in developing the vesicles in small-pox we, in India, have only too many examples, where it is possible to treat small-pox cases in wards from which the chemical rays are excluded by thick red curtain or red glass, as in a developing room, the results appear almost uniformly satisfactory, suppuration in many cases not taking place, the fewer being slight searing, insignificant, and the mortality comparatively low.

Sunburns, freckles, the pigmentations of the skin are attributed to the action of the chemical rays and not to heat. Finsen states, from experiments made with electric light, which has a greater proportion of chemical rays than the sun, that the effect produced on the skin, when exposed to the Ultra Violet Rays (chemical rays) only, differs from that produced by heat in that the resulting inflammation is not immediate, and in fact does not develop for some time, reaching its height in from 12 to 24 hours, and leaves a pigmentation of the skin. The inflammation develops only on the exposed parts, whereas heat rays may also act through the clothes.

In the treatment of Lupus by the Ultra Violet electric rays which I had an opportunity of seeing at the London Hospital, the part exposed to the action of the Ultra Violet Rays, even after an hour, showed no signs of inflammation, though this developed and in the course of some hours reached its height. After such treatment the diseased skin gradually takes on a healthy, if seared appearance.

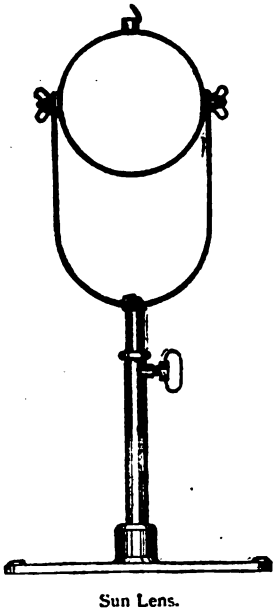
For the purpose of this article it will be sufficient to describe only the apparatus used for sun treatment, the principle of which is also applicable to the electric light. This apparatus consists of two parts:—

1. A sun lens with a thin glass back and a curved front, the space between the glasses is filled with an ammoniacal solution of sulphate of copper or methylene blue.

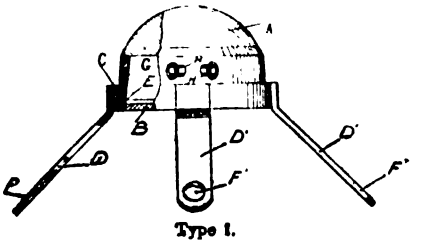
The lens which has a 10- inch diameter and a focal length of 25 c.c. is mounted in gimbals on a stand with a vertical adjustment.

2. The rock crystal compressors.

FIG. 1.



Sun Lens.



Type I.

FIG. 2.

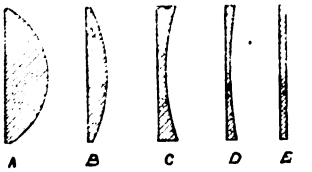
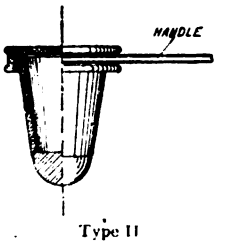


FIG. 3.



Type II

TYPE I.—The compressor consists of two rock crystal lenses (A and B) with a space for the circulation of water between them. The lens B is parallel, whilst the outer one (A) is of the required curve to fit that portion of the body being treated. H H represent the tubes through which the water is conveyed. The arms (D D D") form handles which enable the operator to hold the compressor in the Finsen apparatus without impeding the view through the lens (B). By unscrewing the ring (C) the back lens (B) and its rubber washer (E) can be removed and all parts got at for cleaning.

The clear aperture of this type is 1 inch in diameter. It can be made larger if specially required. The front lens is made in the shapes figured A, B, C, D and E, or can be supplied to any intermediate curve.

TYPE II.—This consists of a conical mount with a flat lens at the upper end and a hemispherical lens about ½-inch aperture at the lower end with a water space between. It is supplied with a clip handle.

The above illustrations are by the maker Beck, Cornhill, London. With a view to regulating the absorption of heat rays, I have, by the introduction of a second tube arranged for the circulation of water in the space contained between the glasses of the sun-lens.

By this means the lens can be used to meet variations of temperature in any of the following combinations:—

1. With water.
2. With water circulating.
3. With water coloured.
4. With water coloured and circulating.

It should be noted that the compressors should be applied with sufficient pressure to render the portion of skin under treatment anæmic.

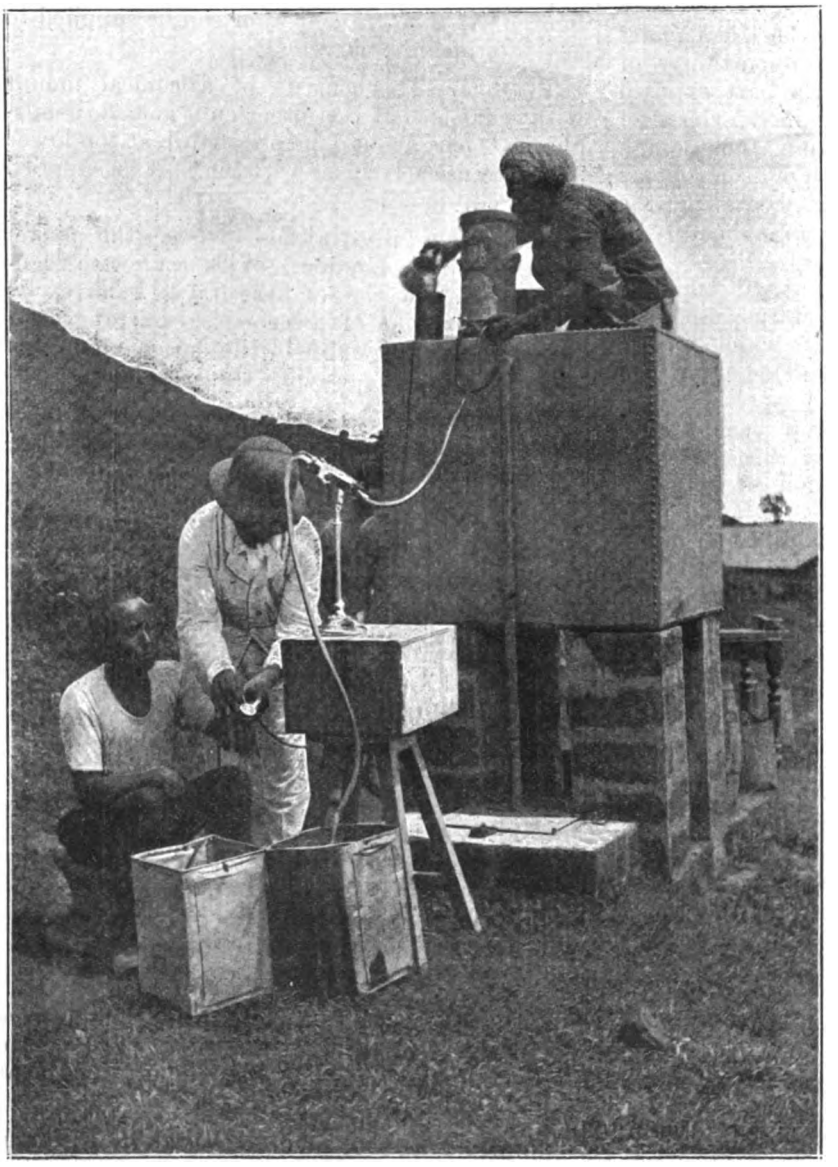
Figures 5 and 6, photographs kindly taken for me by Mr. O. Mawson (I. P.), shows the apparatus in position.

Although treatment by the Ultra Violet Rays, especially in Lupus, has been attended with considerable success, I doubt whether, as a therapeutic agent, it will be able to compete with the Röntgen X rays or the emanation of radium.

The former has been shewn to give as good results in the treatment of Lupus as the Ultra Violet Rays.

As regards the latter, from time to time cases of rodent ulcer, Lupus and malignant disease are reported as having been successfully treated by this substance. That the emanations (electrons) of radium are bacteriacidal has been shown by Mr. Henry Crookes, who delivered an interesting lecture on this subject before the Royal Society in June last.

It is perhaps too early to prophecy, but it is probable that in radium we have a powerful and rapid method of treating, amongst others, the diseases mentioned above, and it is likely, if the destructive effects it exerts on the tissues can be controlled, it will replace both the Ultra Violet and X-rays as a therapeutic agent.



THE MANUSCRIPTS OF NAPLES AND THE VATICAN, AND THAT OF BONCOMPAGNI (ALBERTOTTI) CONCERNING THE OPHTHALMIC WORK OF BENVENUTO, WITH SOME CONSIDERATIONS AND THEORIES OF RECLINATION OF CATARACT.

By Professor GUISEPPE ALBERTOTTI.

(Translated by Miss K. E. WILKINSON.)

After mentioning the sources from which the different manuscripts were obtained and giving a short description of each, Professor Albertotti summarises the main features of the operation as performed by Celsus, Benvenuto and Bartisch. The first named operated in the beginning of the Christian era, Bartisch at the end of the sixteenth century, and Benvenuto in the thirteenth or fourteenth century. The directions are given in the words of each as follows:—

Celsus.—Wait till the cataract appears not liquid but of a certain hardness. Little food must be taken before the operation, and nothing but water drunk for three days. The patient must abstain from everything the day preceding the operation. After this, the patient is placed in a well-lighted apartment so as to have the light full on his face, and the doctor is seated before him somewhat higher than he, while a servant at the back holds the patient's head so that it may remain steady during the operation, as the slightest movement might result in the complete loss of sight for ever. The eye that is to be operated upon ought to be rendered steadier still by covering the other with wool and bandaging it. The left eye ought to be operated on by the right hand and *vice versâ*. Then the needle or instrument ought to be introduced, and should not be too pointed in case of its bending or breaking, but sharp enough to penetrate easily.

It should be thrust in straight across the apex of the two membranes, between the black of the eye and the angle nearest to the temple, in the direction of the centre of the cataract so as not to cut a vein. This must be done cautiously, inserting the needle into the empty

space. Any one, even though he be not very expert, can tell the moment the right point is reached, as no resistance is felt. At this point, the needle must be bent with great delicacy towards the cataract, bringing it little by little under the pupil, having passed which, it is necessary to press more heavily so that it remains attached to the lower part. If it remains there, the operation is at an end; if it returns quickly upwards, a cutting and division should be done there with the same needle; the parts separated from each other may be more easily gathered together and are not injurious to the sight. Then the needle may be withdrawn, and soft wool soaked in white of egg to receive the inflammation is placed on the eye, and finally the eye is bandaged. After this, the patient must be kept quiet and abstain from food and anoint the eye with light medications. Food should at first be liquid, so that the jaws may not be fatigued; then when the inflammation is over, it may be such as is given to the sick or wounded. It is compulsory that water solely be drunk for a long time.

Benvenuto.—The cure is this. Thou shouldst give the patient our Gerosolimitani pills (*long prescription given*). Next day, towards the third hour, the patient having fasted, thou shouldst make him sit astride of an ordinary chair and thou shouldst sit before him in the same way. Keep the good eye of the patient shut and begin to operate on the bad eye, in the name of Jesus Christ. With one hand raise the upper lid, and with the other hold the silver needle and place it in the part where the small angle of the eye is. Perforate the same covering of the eye, turning the instrument round and round between the fingers, till thou hast touched with the point of the needle that putrid water which the Arabs and Saracens called *Mesorat* and which we call cataract.

Then, beginning from the upper part, remove it from the place where it is before the pupil, and make it come down in front, and then hold it for as long as it takes to say four or five *Paternosters*. After, remove the needle gently from the top part. If it happens that the cataract reascends, reduce it towards the lower angle, and when you have introduced the needle into the eye, do not draw it out unless the cataract be situated in the place described above; then gently extract the needle in the same way as you put it in, turning it about between the fingers. The needle being extracted, keep the eye closed and make the patient lie flat on a bed, keeping him in the dark with his eyes shut, so that he does not see the light or move for eight days, during which time put white of egg on twice a day and twice during the night. The patient may eat boiled egg and bread, and if young, drink water; if old, wine much watered.

Bartisch.—The day being decided upon, on which the operation is to be performed, the doctor who is obliged to, or who wishes to do it, must abstain from wine for two days beforehand. The patient also must fast the same day, and must neither drink nor eat much or little till an hour after the operation. Given the aforesaid conditions, try and procure a well-lighted room, in which the patient may have everything necessary for going to bed and remaining there, as he ought not to be taken to any place far off, the nearer to bed the better. Set thyself on a bench in the light and turn thy back to the window. The patient may be seated on a chair, a stool or on a box before thee and near to thee, in any case he is to be seated lower than thyself. His leg between thine and his hands on thy thighs. A servant stands behind to hold the patient's head. The servant should bend a little so that the patient may rest his head against him.

When the patient is blind of one eye only, the other eye should be bandaged with a cloth and a pad so that he cannnot see. Then take the intrument, or the needle in one hand, so that the right hand will be for the left eye and *vice versa*. With the other hand separate with great care the upper eye-lid from the lower, using the thumb and the first finger, so that thou canst see how to direct the needle into the eye. When thou wishest to introduce the needle, the eye must be turned towards the light and looking straight at thee, also, I should make the patient turn his eye a little towards his nose so that thou canst use the instrument better and that thou wilt not injure the small veins of the eye but respect them. Direct the needle straight and with attention over the membrane called *conjuntiva*, straight towards the pupil and uvea at the distance of two blades of a knife from the membrane called *cornea* or from the grey that is in the eye. Hold the needle quite straight, hold it steady so that it will not deviate or slip. Hold the needle and press it and turn it with the fingers in the eye with great gentleness according to the instructions you may gather from the figure, which shows an eye in which the cataract has been taken away, while the other eye has not been touched. Hold the needle firmly while turning it round, and be careful always to have the point towards the middle of the eye against the uvea; and not to oscillate by any chance towards one side. When thou feelest that the needle has penetrated into the eye, that it almost touches the pupil and the uvea, and when thou hast proved to be really in the eye, hold the needle securely and move it, letting it slip backwards and forwards towards the pupil till thou art certain of being in the substance of the cataract which thou canst easily be sure of by the movement of the cataract material.

When thou hast remarked that, lower it carefully and gently and slowly so as not to disturb the cataract. But try and free the matter entirely from the pupil and from the *uvea* with care and keep it intact. Press the said matter with the needle under it, with the greatest care

and when thou perceivest that it is altogether free and loose, draw and direct the needle with the matter behind it, upwards and then pass it well downwards, between the thin retina and the *aranea* of the eye; and take care that it remains there.

When it happens that the cataract is still tender and young and remains hanging from the needle, try with care to draw it towards the fundus of the eye, and turn the needle between the fingers till the cataract is detached from it. Then close the eye with the upper eyelid, drawing out the needle. The cataract happening to be very young and light enough to reascend, as happens continually, and places itself anew before the pupil and the *uvea*, thou shouldst with care move about the place where it reascends, and with gentleness recouch it anew till it remains still in one spot. And with such miniature cataracts thou oughtest with great care to move about so as not to disturb or lamat it, as in lamating it, thou causest irreparable damage to the sight.

The substance of the cataract having grown at either extremity over the sides, or on the *uvea* or *cornea*, thou shouldst with care try to go with the point of the needle under the root of the cataract, where it has grown; or thou shouldst try even to run through the grown root, with the needle, and thus, with precautions, set it free. It often happens that intelligent persons and those used to operating find such things arise, and it often happens that such cataracts grow in such a way that it is not possible to free them at all. And with eyes, one should not act in haste and without care as if one imagined that no suffering was entailed. The matter of the cataract presents extraordinary wonders; often one sees, that is to say, a strange cataract, appearing old and it appears also thick and solid and thus one judges it a favourable one for operation, but if one touches it with the instrument, it often will not tolerate any drawing away, it will not be grasped, nor pushed, much less couched and on the other hand it reascends upwards like cotton or like a feather in water. I have seen and operated on cataracts which were twenty and thirty years old and which one would have thought the finest, but instead, in the operation, they have dispersed or melted away like butter in the eye.

And this occurs generally with white milky cataracts. On the contrary I have seen and operated on cataracts of only six, twelve or twenty or thirty weeks; from the thin appearance one would have thought them not fit for operation, but they have proved very good, and the persons to have wonderfully good sight afterwards. But for such it is necessary to exercise much discretion.

This is the recognised instruction, research and indication of the means of operating or of pricking the cataract or of the manner in which such an operation ought to be initiated and conducted. But no one ought to undertake such an operation, unless he has learnt much and seen much, and unless he is fundamentally taught by intelligent doctors. Unless he is so, it is not well to operate. And it is not wise to trust to any of the brotherhood who happen to be dressed in velvet or silk and who boast of being great oculists and are capable of curing the blind from cataract. Certainly these can make holes in the eyes, but I do not know how they can succeed.

Reflections on Couching.

Comparing these three descriptions, it is obvious that the last two are modelled on the first, that is to say on that of Celsus who describes the operation on cataract carried out by sclerotic incision with a hinted observation on discussion. Benvenuto defines the time during which, about 80 seconds, the cataract may be held steadily below with the needle before letting go and extracting the instrument from the eye. Bartisch completes the technique of the work with the above written description, admirable as to particulars and for the determination of the different moments during the operation, all of which information may be profitably read even to-day.

The surgical cure of cataract by couching is treated of as distinguished from the other two methods, which are discussion and extraction.

Couching means displacing the cataract in such a way as to leave the pupil free and open to the rays of light.

This method might be called displacement or dislocation of the cataract. According to whether the sclerotic is pierced or not, the operation taking the name of sclerotic puncture or of corneal puncture.

If, in the act of operation, the cristalline is pushed behind and below in such a way that at the end of the operation, it remains placed with its front below and its back above, the process takes the name of depression or couching.

If, instead, the cristalline is pushed behind and below in such a way that at the end of the operation it remains with its back below and its front above, the process takes the name of reclination. These are the fundamental processes which are subdivided into many others or into a variety of fundamental processes according to the different schools and different operators.

With Celsus's method of couching, sight has certainly been restored to millions of blind people. Although the same method (probably practised long before Celsus) was in use until the middle of the XVIII century, it gave place, after Daviel, to the method of extraction, which in the second half of the century we are hardly used to calling past, under Graefe's influence became general. That method, however, was not given up altogether, and it was practised in Italy by a worthy upholder, Gradenigo, and by Magni and Businelli, the Nestor of Italian oculists. He

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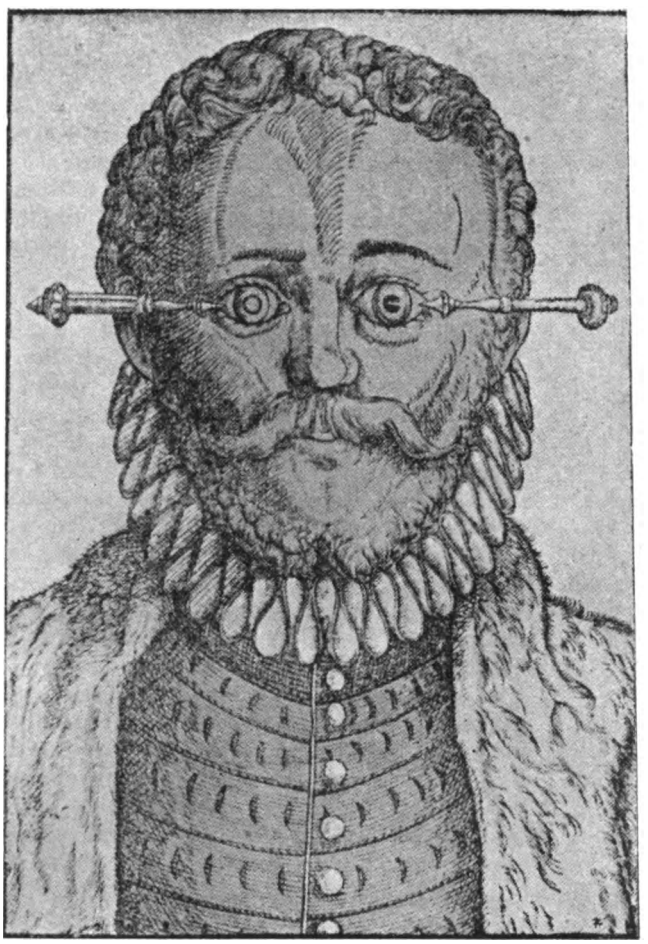

mentions it in his monograph "Various Methods of Operating on Cataract," and Rampoldi in his instructive Clinical Notes says "it is right to couch the cataract in some cases." All this shows that in some contingencies even to-day the method of couching is the only resource which remains to us in operating on cataract. The argument was treated of at the Congress of Genoa by the *Associatione Oftalmologica Italiana*, October, 1886.

Lastly, couching of cataract was treated of very fully at the International Congress of Medicine in Paris in 1900, at the meeting held on the 7th August, of which I had the honour to be President.

I give a brief resumé of the discussion which took place.

The illustrious Professor Truc of Montpelier observes that the couching of cataract seems to be universally abandoned, and that he never sees it carried out. He considers that Graefe himself admitted that this method gave at least a percentage of 60% of good results; he adds that the actual antiseptic treatment might raise the percentage of successes, and one wonders if the couching process, which only requires one ocular function, is not preferable to extraction, especially when movement of the patient, profuse hæmorrhage, ligation of the lens or suppuration of the eye is to be feared. He goes on to say that, although couching is preferable in many cases, it is still uncertain yet that in the successive cases, the symptoms were so severe as to induce him to operate. In the first cases, a bad cough existed, and extreme nervousness in the second case also, there were a violent cough and an accentuated arterio-sclerosis.

He briefly refers to the clinical history and the particulars of the operations in these two cases, after which he makes various observations referring to the cases in which couching should be carried out. According to him couching should be performed on animals, idiots, delirious people, some epileptics or drunkards when one eye has been lost by extraction and subsequent hæmorrhages, and it is to be feared that the same accident might happen to the other eye. Considering then that extraction now reigns supreme, young operators forget the other method. He wishes to ask the question whether or not this ancient operation is to be relegated in silence to the past

Panas eloquently relates cases operated upon by him with success. He follows the process indicated by Scarpa, mentions a case which he saw himself which had been operated upon twenty years before by couching by Dupuytren, and which still enjoyed good sight.

Wicherkiercz cites about a dozen cases operated upon by reclination by Professor Juengken of Berlin in most of which he has been able to prove opacity in the vitrious and damage done to the retina, probably due to the depression and then allowing for the immediate success of the operation, he fears subsequent complications and desires that the operation be limited to cases defined by Panas.

Dor is of the same opinion as Truc and Panas, and relates having observed that animals operated upon by reclination have had good sight for a long time; and he tells of three cases where he has operated on people by reclination with great success. Two were old men over 70 years of age and one an old woman of advanced age who would not leave her châlet at the top of the Gemmi (2950 metres) to go to the clinic at Berne and so Dor had to operate on her there. Valude alludes to two cases of reclination operated on by him; the first was very successful, in the second case the cataract was ended after the operation.

The technique of the operation which is practised to-day, is generally described in treatises; amongst these, for the best particulars, see Deval, Mackenzie, Desmares, Galezoewski and the recent publication of Terrien.

Finding it necessary to sometimes operate on cataract by couching it, I asked myself why such a method even then when it was in vogue, as at the present day when it has fallen into disuse, should be nearly always (excepting in rare cases) practised by sclerotic puncture, as well as by corneal puncture. It also seemed strange on consideration that by sclerotic puncture the sclerotic is perforated, wounding the choroid and the ciliary processes also (material very difficult of cicatrization) with the danger of hæmorrhage or of diffusion throughout the bulb of the inflammatory process provoked by the trauma; whilst with corneal puncture a simple and harmless corneal puncture would have been caused which would readily heal. Evidently the preference given to sclerotic puncture is due to the greater care with which, penetrating the sclerotic, one can plant the needle in the lens, towards its periphery perceptibly from above to below, and being able to act with greater freedom of movement on the cataract and to move it from its place. With corneal puncture, however, the needle easily slips (obliquely from below upwards and from before backwards) into the thickness of the cataract, and (because of the limited movements which one has to make across the pupil) one succeeds in manœuvring with it in the desired direction. The question of operation habitually by corneal puncture is only one of overcoming a technical difficulty, I being of opinion that corneal puncture ought to have the preference, proper to overcome the difficulty which has caused the operation to be so little used.

TREATMENT OF GOITRE WITH IODINE.

By TARAKNATH ROY.

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The belief is not uncommon even among the medical profession that goitre or bronchocele is an affection which may be left to take care of

itself. Observed superficially it is nothing more than a slight disfigurement, but cases are known in which the disease, in its acute form, caused severe symptoms as dyspnœa either from pressure upon the wind-pipe or upon the various important structures of the subjacent parts, *viz.*, recurrent laryngeal nerves, etc. Even sometimes it ends fatally with the patient.

It is needless to add here its anatomy and structures as they are familiar to every medical man.

In disease, this gland undergoes various changes and accordingly it is differentiated in various forms.

It has been supposed not without reason that water coming out through the chalk or lime-stone districts and spring-water is particularly apt to occasion the diseases; as in India the use of the water of particular wells and rivulets give rise to the disease. The inhabitants of the villages lying alongside of the *Gundak* river, which flows down through the heart of some of the villages in the districts of Saran, Muzafarpur, Darbhanga and Monghyr are specially liable to contract the disease. The well-water too of the places is of the same character and contains elements which cause the malady. In these places it is said that not only human beings, but also the lower animals of the places, such as dogs, jackals and crows, are not immune from this ailment.

It would also appear that air and locality have much more to do with its genesis than water. In hilly countries the disease is confined almost entirely to the inhabitants in some of the valleys of the abovementioned places where the air is moist and stagnant; in such places the sun does not penetrate readily or for many hours in the day. In large towns, it occurs chiefly amongst the poorer classes of people who live in kitchens or in damp, ill-ventilated streets and houses; but in cases of the rich it is mainly found among children and young people who devote themselves to a sedentary and in-door life.

The most recent theory of this glandular enlargement is mainly shewn that the active principle of the secretion of this thyroid gland is an albuminous compound containing "Thyro-Iodine," and so it is suggested that the cause of this enlargement may be due to the absence of iodine into the system, and thereby the compensating hypertrophy of this gland ensues. For this reason, I am of opinion that the object of treatment in such cases should be to supply by any means iodine in any shape into the system. This supply may be guided either externally or internally, *i.e.*, either by direct or by indirect means or by both.

Firstly in cases of each goiterous patient I advised him, if possible, to leave the affected circle and, if not, he was advised to take his drinking water after boiling.

I obtained much good result with the use internally of any preparation of iodine with thyroid or thymus gland extract.

I prescribe internally :—

Potassii Iodidii	...	...	grs. v
Syrupi Ferri Iodidii	...	...	3 ss
Spiriti Ammoniæ Aromatici		...	m. xv
Liquor. Thyroidii	...	...	m. v
Aquam	...	...	ad. ʒi

M. ft. misce., one, ter in die.

The dose of potassium iodide was raised gradually from 15 grains to one drachm daily, if the patient did not shew any distinct signs of improvement in a few weeks. I also prescribed tincture of iodine 5 to 15 minims, three to four times a day, administered in a capsule or with the above mixture instead of potassium Iodide; beginning with the minimum dose and increasing one minim daily till 15 minims are taken.

And externally after the application of biniodide of mercury ointment, which is in much practice in India, for some time, I injected hypodermically tincture of iodine 20 to 30 minims at a time of my each injection into the gland at an interval of four or five days. But some surgeons use to inject perchloride of iron or 3 to 5 p. c. solution of carbolic acid in water and glycerine, using from 20 to 30 minims of this solution at a time and injecting once a week instead of iodine.

The method of hypodermic injection of tincture of iodine into the gland had been adopted by me in about two dozen cases with successful good result; of which I may mention a case treated in the said method when I was in charge of a muffasil dispensary in the district of Monghyr in December 1902; I had to remain there for only a few months, so I had not had the ample opportunity of satisfying myself as to the efficacy of the test.

However, during this short period I had at my disposal I tried several cases. I took special care in making a rough chemical test of water used for drinking by the affected men. Both the river water and the water from the wells, of the place presented magnesium and other salts in great quantities.

The daily attendance of patients of all ages attacked with goitre was large there. In their treatment I tried at first biniodide of mercury ointment (grs. x or xv to ʒi) well rubbed in, for several days at an interval of three or four days in the scorching heat of the midday sun.

This, however, did not bring in the expected result. There was no marked reduction of the hypertrophied gland, moreover the patient had to suffer much with this application; I then began to observe and reflect on more carefully.

Herewith I mention a case treated with iodine.

One day in the month of December 1902, a Hindu male, Bala Shing, *æt.* 35, came to me with an enlargement of his "thyroid gland" on each side of the wind-pipe, slightly bigger in size than that of an orange, for treatment. He said that he had got this enlargement with gradual increase for over ten years or so.

On the very day he appeared before me, I adopted at first the routine plan of treatment—the application of biniodide of mercury ointment (grs. x to ʒi) to the part. I pushed it on for about a fortnight, but the patient one day complained that he was much dissatisfied with this treatment as he could not find anything good.

I, therefore, had an occasion to reflect on the matter more deeply and after consulting the works of authors, I at last thought any medicine containing iodine might be effective as the recent theory said above, "the absence of iodine into the system" and consequently "the absence of secretion of this active principle thyro-iodine from the gland, the compensating hypertrophy of the gland occurs;" with a view to ensure success of introducing iodine into the system and to stimulate the secretion of the gland by irritating its glandular structures, I injected hypodermically tincture of iodine 20 minims at a time of each injection to the enlarged gland. Of course, I had to take every possible antiseptic precaution of both the instruments and the part to be injected, and also very careful about the vessels, *viz.*, internal jugular vein, etc., connected therewith, as a puncture to them may prove fatal to life by communicating with the air outside. Internally I prescribed iodine as in the prescription given above.

This method was also satisfactory to the patient, as he said that he had to feel only a very slight burning sensation for a few minutes on the part injected, whereas in the application of red ointment he said that he had to suffer much pain at least for several hours together. In like manner, I injected into the several parts of his hypertrophied gland repeatedly at an interval of three or four days, but after a fortnight I noticed that his enlarged gland had been reducing gradually; so without any hitch, I pushed this method on for a month, and then I saw that it was reduced to about half of its size before; and so by pushing on this plan for about a month more, I again examined the patient and noticed that his hypertrophied gland now came down to its natural size.

There I adopted the plan in many cases with good results, though I had not been allowed more opportunity to reflect more, and so I have not much experience as to the efficacy of this treatment, yet I may say that no doubt this plan of treatment is the surest way of curing the disease.

The treatment varies in different forms of this disease.

COMPULSORY NOTIFICATION OF ENTERIC FEVER IN INDIA.

By W. H. ORR,

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In the *Indian Medical Gazette* for May 1904, we are told "How to cure Enteric Fever," and the writer compares the rate of mortality in this disease in India with the rate of mortality in this disease among cases treated in the London Temperance Hospital, and he attributes the low rate of mortality shewn in the London Temperance Hospital statistics to the method of treatment adopted.

Now, the mortality is higher in some epidemics than in others, and also varies according to age, being less in children than it is in adults.

Again, some enteric cases require little treatment beyond rest, careful nursing and dieting. During recent years so many methods of treatment have been brought forward only to be abandoned after careful trial.

The objection to adopting one method of treatment for all enteric cases is that one is apt to treat the disease only and forget the patient, for in medical treatment the patient always requires careful study on account of "idiosyncrasy." Again, the body has a natural tendency towards recovery, and this must always be borne in mind less in the effort to cut short the disease this power be impaired. Putting aside the question of treatment I do not think a comparison of the rate of mortality in enteric cases in India can be fairly compared with the rate of mortality among these cases in England, for in India "Notification" of this disease is not compulsory whereas in England it is. I know that notification would be most difficult to carry out thoroughly on account of the native community, but I do not see why it should not be made compulsory in cantonments within civil lines and municipalities. If notification were made compulsory more attention would, in my opinion, be directed to cases of continued fever lasting more than ten days in—

(*a*) Europeans.
(*b*) Natives.

(*a*) *Europeans.*—The prevalence of malaria makes the diagnosis of enteric fever in this country more difficult than in England, but examination of the blood generally enables one to eliminate malaria, though the two diseases can co-exist in the same patient, still every practitioner in this country must meet with cases in which a position diagnosis is not easy.

The Widal reaction will confirm the diagnosis of enteric fever, but if the reaction is not obtained, we cannot say the case is not one of enteric as proved by a case which was under my care for a short time. This patient was admitted with symptoms typical of enteric, but the Widal reaction was not obtained, he died

during a relapse and the *post-mortem* examination revealed inflammation and ulceration of Peyer's patches.

Enteric fever among European children in this country is often so mild in character that it is possible to overlook it. Dr. Dawson Williams in his book on "Diseases of Children" writes: "Typhoid Fever is a milder disease in children than in adults, its symptoms less severe, its mortality lower. The severity increases directly with age and is greater at ages over than under ten years. It is as common between five and ten as between ten and fifteen." The fact that in children enteric fever is as common between five and ten as between ten and fifteen is, in my opinion, not sufficiently recognised in this country. In all cases of fever which persists for more than ten days in Europeans in this country the excreta ought to be disinfected and burned.

(*b*) *Natives.*—During the last few years enteric fever among natives of this country has been more frequently recognised, and the theory that the disease seldom occurs among the natives is no longer tenable. Some years ago a sepoy of an infantry regiment was brought to hospital one evening in a collapsed condition and death occurred within a few hours. No *post-mortem* examination was permitted. This man had carried out his usual duties and had eaten his customary evening meal, but a few hours later complained of pain in the abdomen and was brought to hospital.

A few months later, another man of the same regiment, when on field service, died under almost the same conditions but in this case, a *post-mortem* examination of the abdomen was permitted, when a perforation, the result of enteric ulceration, was found.

Again, a few months ago I was asked by the police to examine the body of a native boy about twelve years of age, who was reported to have died from the result of a beating. I noticed that the body was very emaciated but could detect no marks of injury beyond a few scratches. The examination showed typical inflammation of Peyer's patches with ulceration. This hot weather a prisoner in the hospital suffered from continued fever and severe headache. There was no diarrhœa, and no enlargement of the spleen, but for a few days he complained of pain on palpitation over the transverse colon. I sent a sample of his blood to Captain Lamb, I.M.S., Pasteur Institute, who kindly examined the blood and obtained Widal's reaction with a dilution of 1—80. This man contracted the disease outside the jail, he is now convalescent, notwithstanding the improved sanitary condition of cantonments epidemics of enteric fever occur among British Troops from time to time, and it is very often most difficult to account for these epidemics, possibly they may be due to climatic conditions which both make the bacillus more virulent, and at the same time reduce the general health of the population making the inhabitants more susceptible to the disease. During an epidemic within cantonments interesting information might be obtained from studying the mortality in the native villages which surround the cantonments, to my knowledge, this has never been done.

It is evident that enteric fever is not uncommon among the natives of India. Prevention is better than cure, and valuable lives are lost every year from this disease, therefore, in my opinion, the question of compulsory notification as suggested, deserves serious consideration.

NOTES ON A CASE OF GENERAL LYMPHADENOMA (HODGKIN'S DISEASE).

By S. N. DATTA, M.B.,

ASST.-SURGN.

Read before the Port Blair Medical Society.

Convict No. 26398 A, Appu, Muhammadan male of about 45, was admitted into the Bamboo Flat Hospital on 7th November 1902, for the treatment of a small tumour of the nature of lymphangioma on the inner side of left arm, and shortly after the removal of the tumour, a general enlargement of the lymphatic glands of the body commenced, and the case became one of general lymphadenoma (or Hodgkin's disease), running a comparatively rapid course and terminating fatally within 19 weeks of admission into hospital.

The man had arrived at Port Blair on 18th April 1880, convicted of dacoity.

He was born of Abyssinian parents, domiciled in India and came from the Presidency of Madras.

There was no family or personal history of venereal, tubercular or glandular affection.

There was a scar on the left groin, evidently the result of an old healed bubo. There was no evidence, however, as to whether it was venereal or not. His medical history sheet showed no admission into hospital for any disease. There was no history of immediately preceding exposure or mental depression, predisposing to the disease; still as he was a convict, the possibility of these cannot altogether be excluded.

He was a tall, strong, muscular, well nourished man, enjoying very good general health. About a year before his last admission into hospital, patient said he had a boil on his left arm. He squeezed out the matter, and the boil healed up in a few days' time, leaving a small cicatrix. After some time the cicatrix commenced to grow in size, and about nine months afterwards (*i.e.*, three months before his last admission), a copper coloured more or less circular and thickened patch of skin was noticed on the inner side of the left arm, about 1¼ inch in diameter and ½ inch thick. As there was no pain in it, nor any kind of inconvenience from it, patient did not then come into hospital. When, on the

7th of November 1902, the patient sought admission into hospital, there was a small flat tumour on the inner side of his left arm, about 2 inches in diameter and ½ inch thick, discoloured and sloughy on its surface, adherent to the skin, but non-adherent to the subjacent structures. It was removed under chloroform on the next day, and on section was found to be firm fibrous, anæmic, and in places minutely loculated. The wound of operation was of course stitched and dressed antiseptically. At this time only the neighbouring left axillary glands were enlarged and tender, no other glands of the body being affected; and the general health was good.

Shortly after the operation, the left axillary glands became more enlarged, and the whole of the left arm and forearm swollen and indurated, without any pain or rise of temperature, and there was also a copious lymphatic discharge from the wound of operation. This was soon followed by the commencement of general enlargement of the cervical axillary, inguinal and femoral glands.

In text-books, local irritation is mentioned as an improtant factor, in the etiology of Hodgkin's disease, the glands in the immediate neighbourhood of the source of local irritation being first affected, followed by the general appearance of the disease in other glands. The same appears to have been the state of things in the present case.

From the appearance of swelling of the lymphatic glands the case assumed a special character, and the further progress of the case may be sketched under the following headings:—

Lymphatic System.—The most prominent symptoms and visions were in connection with the lymphatic system. The enlargement of the lymphatic glands mentioned above went on steadily increasing, till in the later stages some of the femoral glands were of about the size of an egg; some of these glands also became occasionally painful, the pain subsiding after a week or so, to re-appear after some days in some other group.

A few days after the appearance of pain in the superficial glands, the cutaneous lymphatics also were affected, small thickened copper-coloured circular patches appearing on the skin of the face, trunk, and, later on, on the extremities. These patches went on increasing in size and number, and in later stages, these were so prominent and coalescent as to give his face and trunk a distinctly swollen appearance, still later on the deeper lymphatic glands began to be affected, and pressure symptoms developed. These were singing in the ears, throbbing in the head, dyspnœa, pain in swallowing, œdema of extremities, and constipation.

Spleen.—In the early stages, this gland was not perceptibly affected, there being no enlargement or tenderness in it. When, however, the disease had fairly advanced, it commenced to be enlarged and tender; ultimately it occupied nearly two-thirds of the left side of the abdomen, and was distinctly painful.

Circulatory System.—Early in case, the heart was strong and healthy and regular, the pulse was full, strong and about 80 per minute. Later on, as the disease progressed, the heart became weaker, the pulse softer and quicker, and anæmia noticeable, and ultimately the heart's action was extremely feeble and irregular, any slight exertion giving rise to palpitation, and anæmic bruit could be heard over it.

The pulse also was rapid and irregular, about 120 per minute, and anæmia was well marked. Several examinations of blood were made, the results of which are attached herewith. They show a gradual decrease in the relative number of red corpuscles and increase of white corpuscles:—

	Thoma Zeiss.		(Gower's.)
Date.	R. B. C.	W. B. C.	... Hæmoglobin.
15-12-1902	...	...	·36%
18-2-1903	2,488,000	8,000	·32%
23-2-1903	1,252,000	10,000	...
12-2-1903	1,602,000	118,000	·22%

Differential count of W. B. Corpuscles.

Date of examination.	Large mononuclear.		Small mononuclear.		Neutrophiles.		Eosinophiles.		Others.	
	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.	No.	P. C.
15-12-02	33	6·11	111	20·36	370	68·58	24	4·40	3	0·55
8-2-03	50	4·54	700	64·54	320	29·09	...	...	20	1·81
23-2-03	60	11·11	200	37·03	260	48·14	2	0·37	18	3·33
12-3-03	50	11·20	222	44·40	208	41·6	...	...	14	2·80

Alimentary System.—At first the appetite was good, digestion perfect, and the bowels regular. As the disease was advanced, there was gradual loss of appetite, digestion slow and painful, difficulty in swallowing, constipation. The bowels had to be kept open by purgatives and enemata. The gums were soft, pale and swollen, and the tonsils enlarged, and the pharynx, was covered with nodular swellings. In the later stages all attempts at taking solid food were given up, and small quantities of liquid food were all that could be taken.

Liver.—This organ was not enlarged till a later stage of the case, and dull pain and tenderness were then also complained of. There was no proper secretion of bile as evidenced by the pale and constipated motions, but there was no jaundice.

Respiratory System.—In the early stages the lungs were healthy, and the respiratory sounds and the rate of breathing were normal. As the case advanced, the number of respirations per minute increased to 30 and over, and there was dyspnœa, which became worse on exertion, and

rales of an œdematous nature were heard over the bases of the lungs.

Nervous System.—In the advanced stages of the case, there was throbbing in the head, singing in the ears, sleeplessness, dreams and startlings, and weakness of limbs, though not actual paralysis.

Genito-urinary System.—The urine was free, pale at first, rather high coloured, later on acid in reaction with no sugar or albumen and containing urates, epithelium and mucous. In the later stages of the disease, a few superficial ulcers developed on the prepuce, due to failure of nutrition and friction of cloth on the skin and mucous membrane. Raised copper coloured patches, more or less circular, and each about ½ inch in diameter appeared on the skin, comparatively early in the case. These increased in number and ran into each other as the case progressed. In the later stages both the skin and mucous membrane were pale and œdematous.

Temperature.—The temperature was generally normal, being about 98·4° in the morning and 99° or so in the evening, and slightly sub-normal in the later stages.

Weight.—There was no marked loss of weight noticed throughout the whole course of the case; on the contrary, the man weighed about two pounds more about a week before death than he did at the beginning; this was, no doubt, due to the œdematous condition of all the tissues. The symptoms and conditions described above became steadily aggravated as the case advanced and shortly before its termination the condition of the patient was as follows:—

There was a general swollen and anæmic appearance about the patient, the skin was œdematous, especially marked over the hands and feet; there were thickened patches of skin over the whole of the body, most prominent about the face and trunk, so as to give them a swollen appearance. The lymphatic glands, superficial and deep, were extensively affected, giving rise to an enormously swollen and stiff appearance of the neck, and to fullness and prominence of the axilla and the inguinal and femoral regions, and fullness and hardness of the abdomen and to pressure symptoms, *e.g.*, œdema of the extremities, singing in the ears, throbbing in the head, pain in swallowing, dyspnœa and constipation.

There was enlargement and tenderness of the spleen and liver, loss of appetite, slow and painful digestion, and obstinate constipation. There was extreme anæmia, with general pallour of skin and mucous membrane; great general debility, with dyspnœa and palpitation on any exertion. Patient was bedridden and had to be helped to get up and move in bed, sleep was short, shallow and disturbed by dreams. The temperature was normal or slightly sub-normal.

All attempts at taking solid food was abandoned, and small quantities of liquid food was all that could be taken.

The above conditions were gradually aggravated. On the morning of 18th March 1903, patient was found lying in his bed utterly exhausted with great dyspnœa and palpitation of the heart, pale face, cold perspiration on forehead, and small, feeble, irregular and intermittent pulse. Gradually he passed into a comatose state and died at about 10-45 A.M.

Treatment.—He was treated at first with increasing doses of iodide of potassium and external application of iodine and belladonna with very little good effect. Arsenic in increasing dose was then tried, combined with inunction of an iodoform ointment, and seemed to produce some good results; the thickening of the skin, and the enlargement of the glands with embarrassed breathing seemed to be somewhat better for some time, but there was no permanent benefit. The bowels had all along to be kept open by purgatives and enemata.

Diet.—At first the appetite and digestion of the patient was very good, and he took and digested his ordinary rations of rice, flour, *dal*, and vegetables, together with extra milk, bread, eggs and meat. Later on, as the appetite failed, he could take less and less of the above-mentioned solid food, and ultimately his diet consisted of milk, soup, eggs, conjee and bread.

Post-mortem examination of the body held at 4 P.M. of the same day showed the following:—

Rigor mortis present in jaws and neck; absent in extremities. Whole body œdematous, serous fluid escaping on section of skin subcutaneous tissues.

Head.—Scalp œdematous. A considerable quantity of serous fluid escaped on opening the dura mater. The membranes of the brain were anæmic. Brain weighed 43 oz. and was anæmic, the loose cellular tissue over the hemispheres being œdematous; about 2 drams of clear serous fluid was found in each lateral ventricle.

Chest.—The bronchial glands and those of the upper part of the anterior and posterior mediastinum enlarged. Each pleuræ contained about a pound of clear serous fluid. The pleuræ were pale and anæmic.

Right Lung.—34 oz., congested and œdematous throughout. An old patch of pleuritic adhesion at apex. Pieces floating in water. No caseous or miliary nodules were found.

Left Lung.—In similar condition to the above, weighing only 18 oz. and not so congested.

Pericardium.— Anæmic contained about 6 oz. of serous fluid of a light lemon colour.

Heart.—12 oz. (when empty), covered with œdematous, cellular and adipose tissue. Both ventricles filled with thin dark fluid blood. Walls of both ventricles thickened. Valves healthy.

Liver.—88 oz., enlarged, of a brown colour, nutmeggy in places, smooth on surface. Sections were firm, smooth, and dry and mottled.

Spleen.—54 oz., enlarged, congested, firm, section rough granular, mottled. Three caseous nodules were found in spleen substance.

Kidneys.—10 oz. together, both pale, smooth and dry on section.

Pancreas.—Enlarged; matted together with the surrounding lymphatic glands.

Alimentary Canal.—Tonsils enlarged, and greyish red on section. Nodular growth on pharynx and about base of tongue.

Oesophagus—Anæmic; stomach and intestines showed patches of congestion and superficial erosions.

Larynx and Trachea.—Anæmic.

Lymphatic Glands—A large number of enlarged lymphatic glands were found in the neck, some close to, and presumably pressing upon the trachea, œsophagus, veins, and nerves. A large number of enormously enlarged glands were also found in the abdominal and pelvis cavities. Almost all these glands were soft, of a dark red or reddish brown in colour, dark red or reddish grey on section; none of these were caseous; an opaque reddish grey fluid could be scraped out of the sections. As to size, some of the cervical glands were as big as a walnut; and also were the axillary and retro-peritoneal glands; some of the inguinal and femoral glands were almost as large as a hen's egg, as some of the pelvic glands were of the size of a goose's egg; the biggest pelvic gland weighed 2 oz.

A Mirror of Hospital Practice.

INTRACRANIAL OPERATION FOR CURE OF TRIGEMINAL NEURALGIA.

By W. J. NIBLOCK,

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Government General Hospital, Madras.

K. P., Hindu, road *maistry*, aged 35, was admitted to hospital, on 2nd June 1903, for very severe trigeminal neuralgia (right side), which commenced as such four years ago. *Family history.*—Good. *Personal history.*—Has not suffered from malaria, syphilis or caries of the teeth. His occupation is of such a nature as to expose him to cold and wet. *Present illness.*—The patient states that he has been subject to severe attacks of headache, confined to the right side, coming on at intervals of about a month, and brought on by no definite cause. Four years ago he began to suffer from pain of a stabbing character along the line of the upper teeth on the right side, radiating toward the eye. Later on he also suffered from pain starting from the middle of the right eyebrow, and during these attacks, which occurred about three or four times daily, there was profuse lachrymation from the right eye. The pain, although severe, was not sufficiently so to keep him from his work. He got himself admitted to hospital in 1900, and was operated upon by me on 20th June of that year for the supra-orbital pain. The following notes were then entered in the operation book: 'a very severe type of tic douloreux. Has been under treatment in the medical wards without any appreciable good results, spasms and pain extremely severe. Great thickening over and around supra-orbital (due to constant rubbing of the part). Incision made over supra-orbital nerve, which was exposed inside the orbit and pulled out with catch forceps; about 2½ inches dragged away, including two branches.' He was discharged 'relieved' on 16th July.

The patient states that after the operation he suffered from no pain until about six months ago, when it recurred and became worse than before.

Formerly the pain was referred chiefly to the supra-orbital, although the spasms affected all the muscles of the right side of the face; now the pain is all over the area of distribution of the fifth nerve, and the spasms (which occur every ten minutes or so during the day and last usually from three to five minutes) are terrible. The patient has lost flesh considerably, partly owing to loss of sleep, and also to the fact that he is afraid to eat, as attempts at mastication at once cause spasms. He relieves the pain by friction over the right eye and cheek, and as a result of this rubbing several acneform sores are present. The pain is described by the patient as like that which would be caused by stabs of red-hot needles. He has become quite despondent and has several times thought of putting an end to himself. His teeth are good and no peripheral source of irritation is discoverable. All the typical signs and symptoms of severe tic douloreux are present. The skin over the affected area is much blacker than on the left side of the face and is hyperæsthetic.

Before operation was decided upon, the following drugs were tried without any good result; butyl chloral hydrate, gelsemium, sodium salicylate, quinine, strychnine, potasium iodide, potassium bromide, morphia, exalgin, paraldehyde and others.

Operation.—On 19th July 1903, after anæsthetization with chloroform, the right eyelids were stitched together.

An Omega-shaped incision was then made, with its base corresponding to the zygoma and extending from the external angular process of the frontal bone to the tragus. The upper part of the incision corresponded with the temporal ridge. The incision was carried down to the periosteum and all bleeding vessels clamped. Then the periosteum was separated from the bone for a short distance. A flap of bone, corresponding with the circle of the Omega, was then made by a small trephine and Gigli's saw without much difficulty. The bone and skin were then turned down in one flap. At this

stage one branch of the middle meningeal artery required to be clamped. Oozing from the diploe was stopped by adrenalin chloride solution (1 in 2,000).

The dura mater was then separated from the anterior fossa until the foramen spinosum was reached. Here the middle meningeal artery was torn across and began to bleed furiously. Attempts were made to plug its foramen with Horsley's aseptic wax, and then with a wooden peg, but without success. During this time, owing to the terrific hæmorrhage, plugging with sterilized gauze had to be resorted to several times. In the intervals attempts were made to expose the ganglion. This, however, could not be done as one was practically working in the dark on account of the bleeding.

Finally the cavity was packed with gauze, the bone and skin flaps replaced, and the patient sent back to bed. He recovered well from the operation and suffered comparatively little from shock.

Second operation.—On 23rd July. Patient anæsthetized and eyelids stitched as before. On removing the dressings the wound was seen to be clean and dry. Stitches removed and flap turned down as before. The gauze plug which had been left in was carefully removed, and all hæmorrhage from the middle meningeal was found to have stopped.

The separation of the dura mater to expose the ganglion was then proceeded with. The separation was performed by the finger, the brain being kept out of the way by a broad retractor. As soon as the separation of the dura began hæmorrhage (venous) recommenced, and gauze had to be frequently used to swab up the blood. After some little time the second and third divisions of the fifth nerve were cut across and pieces of each removed together with part of the ganglion, and the distal portions of the nerves were pushed into their respective foramena by a probe. From the subsequent progress of the case it would seem that the first division was also cut across at the same time, although during the operation one was not sure of this. An attempt was next made to expose the ganglion sufficiently to admit of its entrie removal, but as soon as traction was made on the retractor to draw the dura and brain sufficiently out of the way the hæmorrhage became so severe as to fill up the cavity and obscure everything. Apparently the bleeding at this stage came from the petrosal sinus which may have been damaged during the process of separating backwards the dura which was unusually adherent.

The cavity was plugged with gauze, soaked in adrenalin (1 in 1,000) but without much effect. So long as retraction was not tried the bleeding gave no trouble, but the moment the retractor was used to keep back the dura out of the way the hæmorrhage recommenced. Several attempts were made with similar results. As the intracranial portions of the nerves, together with part of the ganglion, had been removed, and as there seemed to be no prospect of being able to see what one was doing, and as it was considered unsafe and unjustifiable to attempt removal of the remaining portion of ganglion by the guidance of touch alone, the wound was carefully closed up, the bone and skin flap being carefully replaced, without drainage.

There was no shock after the operation and the patient made a good recovery. On 25th and three or four following days he complained of double vision, but this passed off.

On 2nd August the cornea of right eye was noticed to be hazy, and by 7th of the same month some ulceration of the cornea had commenced. He was treated for this in the Ophthalmic Hospital with satisfactory result.

Sensation was first noticed, after the operation, on the right cheek on 20th August.

The patient was discharged from hosptial on 18th September suffering only from slight ulceration of the cornea.

He has had absolutely no pain since the operation, and has recovered his spirits and put on flesh to a wonderful extent. When seen six months afterwards was still free from pain.

WOUND OF THORAX AND HERNIA OF LUNG.

BY A. C. DUTTA,
ASSISTANT-SURGEON,
Berhampore.

THE present case, which is recorded for the rarity and seriousness of the injury, occurred in a child of 12 years of age who had been injure d by a wild boar. The sixth rib in the mid axillary line on the left side was incompletely fractured and through the wound a portion of the lung, resembling a big marble in size protruded. This did not alter on inspiration or expiration, neither could it be drawn out on simple-traction ; on inspiration a few bubbles of blood-stained froth came out through the wound, very close to the line of fracture. There was a moderate amount of hæmoptysis just after the occurrence of the injury. Evidently the lung was wounded at the point where it was caught between fragments of the broken rib and through which air excaped, leaving the prolapsed portion with no chance of being inflated.

Under the circumstances I thought it advisable to leave the rib untouched ; I therefore separated the nipped portion of the lung with a silver spatula, drew out a little more of the healthy lung, ligatured the base with thick catgut, cut off the herniated portion, returned the pedicle, and closed the wound with iodoform gauze and finally dressed it.

The boy made a complete recovery, though the temperature ranged a little high for the first

few days, and there occurred a patch of broncho-pneumonia, close to the seat of the injury, which ran a typical course and ended in crisis on the 7th day.

When the boy left hospital just a month after admission, air could be made out entering into the lung everywhere except a little bit about an inch in diameter at the seat of the injury; it should be stated that the prolapsed portion consisted of the lower part of the upper lobe.

Remarks:—The interesting features of the case consist in the following:—

(1) The non-occurrence of pneumo-thorax and collapse of the lung, although air entered into the pleural cavity at the time of the accident and all along till the wound was healed. Theoretically a lung should collapse as soon as the pleural cavity communicates with external air, practically, however, it does not always do so; I have seen cases, especially one case, which by a strange coincidence of circumstances came to the hospital at the same time as the present, in which a boy had an extensive incised wound of the right pleura about 6" long, which had been kept partially covered by a dirty rag for one day before admission to the hospital, when it was ultimately sutured; in this latter case air could be heard entering into the pleural cavity during expiration with a distinct flap, and coming out during inspiration with a good deal of froth accompanied by a distinct ballooning of the lung; there was no sign of pneumo-thorax or of collapse of the lung after healing, although the wound took some time to granulate and effectually close the cavity. It is only when there is a patent opening in the lung communicating with pleural cavity that typical pneumo-thorax is so common. This is of very great significance as the pleural cavity can be opened, without any danger of the production of collapse, for exploration or other purposes, with proper aseptic precautions.

(2) Successful removal of a portion of lung without any danger.

Remarks by Major A. H. Nott, I.M.S., Civil Surgeon of Murshidabad—

Collapse of the lung seems to be by no means the rule when a penetrating wound of the chest opens up the pleural cavity, even if the opening is free and extensive; the usual reason given however seems an unsatisfactory one, *viz.*, that it is due to the adhesion of two moist surfaces of parietal and visceral pleura. It is said that collapse occurs much more frequently in the aged than in the case of young subjects, and these two cases would be in agreement with this. I do not think in practice that much weight is given to the danger of collapse of the lung on opening the pleural cavity during a surgical operation; for instance this is not brought forward as contra-indications, or at least does not deter Surgeons in India from opening the pleura when it is unavoidable to select part in the operation for liver abscess. In a case in which I was compelled to open the pleura somewhat extensively, no collapse of the lung of any consequence took place.

The observation as to the rhythm of entrance and exit of air into the pleural cavity in the second case mentioned is certainly opposed to the relationship to inspiration and expiration given in the text-books and as far as my memory goes is opposed to my own experience in one or two cases I have personally seen. There seems, however, to be considerable confusion on the subject, especially in some of the older text-books, *e.g.*, in Holmes' Principles and Practice of Surgery the subject is discussed in regard to the analogous filling and emptying of a hernia of the lung and a case is quoted which was recorded by Mr. Le Gros Clark, in which such a hernia collapsed during each expiration leaving, a deep depression. Holmes says we must conclude that both conditions are found.

ANOTHER CASE OF SPONTANEOUS RUPTURE OF THE SPLEEN.

By E. OWEN THURSTON, F.R.C.S.,
CAPT., I.M.S.,
Resident Surgeon, Medical College Hospital, Calcutta.

In connection with Lieutenant G. I. Davys' case of spontaneous rupture of the spleen published in the June number of the *Indian Medical Gazette*, the following case appears to be worthy of record:—

B.——B.——, Hindu male, *æt.* 20, was admitted into the Medical College Hospital on April 30th, 1903, with a history of abdominal pain of ten hours' duration; the onset was sudden and no history of injury could be obtained. There was constipation but no re-vomiting.

The abdomen was generally tender, the tenderness being most marked in the left iliac region; it was perhaps slightly distended. No evidence of fluid was detected. A fœtid enema was given but with negative result. On May 1st the abdomen was more distended; the distension being most marked in the epigastric region; the tenderness was greater and free fluid was present in the abdominal cavity. He had had no vomiting but complained of much thirst. The appearance of the face was typical of some severe abdominal condition, coleotomy was performed through the left rectus, a large quantity of sanious non-offensive fluid escaped; the peritoneum was slightly injected and there were some doubtful nodules in places, which it was thought might be tubercular. Hard fæcal masses were felt in the colon, but no obstruction was present. The spleen was not examined, as there were no blood clots or hæmorrhage severe enough to suggest that such a vascular organ as the spleen had been ruptured. The abdomen

was washed out with sterile water, a rubber drainage tube inserted into the pelvis and a gauze drain to each flank. On May 2nd the patient had much less pain and the abdomen was not distended. Calomel grs. v was given and the bowels acted. He gradually became weaker, and died at 9 A.M. on May 3rd.

At the *post-mortem* examination, performed by Major F. J. Drury, I.M.S., it was found that the spleen was slightly if at all enlarged and its substance was largely occupied by blood clot; on the outer surface, towards the lower end of the organ, was a small rupture of the substance which had caused hæmorrhage beneath the capsule with the formation of a cyst-like cavity containing serous fluid, this had burst into the peritoneum, setting up peritonitis.* A portion of the omentum was adherent to the ruptured cyst-like cavity. There was no free blood in the abdominal cavity. The other organs were normal, there being nothing to suggest that an infarct had occurred in the spleen.

This case differs from the others reported, in that the spleen was only slightly if at all enlarged. I am indebted to Lieutenant-Colonel R. D. Murray, I.M.S., for whom I was acting at the time for permission to publish this case.

CASE OF GASTRIC DISEASE WITH TETANY.†

By B. ROBERTSON,

MAJOR, I.M.S.,

Government General Hospital, Madras.

A MALE, aged 36, short, thin, emaciated, eyes somewhat sunken and a careworn expression, was admitted suffering from vomiting and sour belching after food; of ten years' duration. The symptoms did not trouble him much and consequently he did not seek for relief earlier. Within the last year there had been considerable distension of the abdomen, and this (distension) he says, has ascended behind the sternum and over the region of the heart; he also had a shooting pain through to his back. The appetite, which was previously impaired, was now completely lost, and he began to lose weight. He had been treated about six months back in this hospital; the treatment consisting of washing out of the stomach. This gave him relief and he returned home: soon, however, to return with all his former symptoms intensified.

The circulatory organs were normal but somewhat weak, pulse soft, regular and 96 per minute.

Respiratory organs normal, but the acts were somewhat accelerated. *The digestive system.*—Great tenderness on pressure over the stomach was elicited. Percussion showed an appreciable amount of dilatation of the tympanitic stomach. The contents after washing out were highly acid (hydrochloric), and contained a quantity of semi-digested food. The ordinary treatment of washing out the stomach was carried out regularly. About 17 days after admission, the patient complained of cramps in the hands and feet (the stomach symptoms for the three preceding days being rather aggravated), and a pain in the left forearm. The feet were found inverted, extensor tendons prominent. Calf muscles hard. In both hands the thumbs were directed inwards and the fingers flexed upon the thumb; forearm flexed upon arm. Patient was unable to turn on his side. Speech indistinct. Tongue slightly retracted. Pulse 89, respirations 22. A quarter grain of morphine was given hypodermically at 8 A.M. Two hours afterwards he was able to speak, the calf muscles were flaccid, he was able to turn on his side, and there was an absence of pain. By 3 P.M. the contractions in his hands and feet had disappeared. During the night he was cold and clammy, an injection of strychnine was given, and he twice vomited a green fluid. On the following morning the patient was in a condition of nervous prostration. The fingers were in a condition of tonic spasm, the other symptoms of the preceding day were present but in a mild degree. On the previous night I had ordered santonin, which acted negatively. The patient was restless throughout the day, enemata were given, and a quantity of yellow fæcal matter was passed. The temperature at 11 A.M. was 97°, at 2-30 P.M. 102°, with a morning pulse of 98 and respiration 24. About 6 P.M. he was in a low state, dysphagia present to some extent, temperature 104°, at 7-15 temperature 106·4°, and death took place ten minutes afterwards. The symptoms of tetany were of so short duration that more extended observations could not be made. A *post-mortem* was made, and the following is a short note as to what conditions were found. Congestion of the dura mater and convolutions. Dura mater adherent to the cortex on right side of the superior longitudinal fissure. Increased quantity of cerebro-spinal fluid. Marked congestion of all the sinuses. There is some necrosis of bone on each side of the superior longitudinal sinus. The other organs were nearly all sound, except cardiac valves, which showed a tendency to degeneration. The gastric wall normal. I have no doubt this was a case of acute tetany following gastric dilatation? But the *post-mortem* does not bear out the diagnosis of dilatation, although all the symptoms pointed in that direction. Osler (4th Edition), refers to a form of tetany following the washing out of the stomach. This may have been a factor in the present instance. There is no evidence to show what happened during his previous admission, six months ago, when similar treatment was carried out.

* We published in this *Gazette*, about 13 years ago, a case very similar to this.—ED., *I.M.G.*

† Republished from Report of Madras Government General Hospital.—ED., *I. M. G.*

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A STEP FORWARD IN INDIAN SANITATION.

We welcome the appointment of Major J. T. W. Leslie, M.B., I.M.S., as the first Imperial Sanitary Commissioner with the Government of India not only because we believe him to be well fitted for the position, but because it is an earnest of a desire on the part of the Government of India to initiate a policy of gradual and systematic improvement in the administration of the Sanitary Department throughout British India, so that that Department may be rendered a more efficient instrument for dealing with the numerous problems of state medicine which still call for solution in this country.

The Government Resolution in which the new departure is announced traces in an interesting way the genesis and growth of sanitary reform in India. It began with the army, but it was soon recognised that no real or striking advance could be made in improving the conditions under which the soldier lived, unless some degree of supervision was exercised over the sanitary conditions under which the urban and rural population around cantonments lived.

The education of a public opinion on matters sanitary has always been slow, but we have always freely recognised that of recent years the attitude of the Government of India has been much more enlightened and very different to what it was some twenty years ago, when medical officers met with disaster for advocating views which were in advance of their time, but which since then have been recognised and accepted all the world over.

The present departure then is an instalment of what we may look forward to in the future. All our readers well know and recognise the difficulties the Sanitary Reformer in the East has to deal with, one of these is the apathetic, and sometimes hostile, attitude of the inhabitants of the country, and the other, and greatest difficulty, is the want of money. Sanitation in India can no more be advanced without spending money than can Education or Irrigation, and we take it that the Government of India in making the beginning of a new Imperial Sanitary Department not only recognise this, but are ready and willing to act upon it.

That this is the intention of the Government is, we think, clear from the following paragraph in the Resolution—

"For the present, therefore, the Governor-General in Council has, with the sanction of His Majesty's Government, determined upon the appointment of a separate Sanitary Commissioner with the Government of India. His advice will be of value not only in settling in consultation with the Local Governments and Administrations the principles on which an advance should be made, but also in giving effect to those principles, with due regard to local conditions and popular prepossessions, to the extent of the resources that are available from time to time. But the Sanitary Commissioner's work will also have another and an equally important side, the organization and direction of research throughout India, which will steadily increase with the progress of the scheme already sanctioned for the establishment on lines similar to those recommended by the Plague Commission of fully equipped institutes for the study of health problems in India. This scheme provides for a central laboratory devoted mainly to original research of a general character, and the manufacture of antivenene and certain curative sera. In each of the larger provinces there will be a provincial laboratory, the primary functions of which will be to conduct diagnosis and special research connected with local conditions. One of these, the laboratory at Parel, will also carry on the manufacture of plague prophylactic. If the scheme is to be efficiently worked and to produce results which will justify the expenditure incurred upon it, the whole body of institutions which it comprises must be under the control of a competent sanitary expert who can supervise, organize and co-ordinate the work, can prevent conflict and overlapping, and being himself in charge of sanitary affairs throughout India, can determine what questions call for scientific investigation and where and by whom the work should be done."

We heartily welcome the establishment of these Laboratories. There is an enormous field of work before them, and as all recommendations for sanitary improvement must be based upon an accurate knowledge of the causation of disease, no scheme for the improvement of matters sanitary in India would be complete or

even useful without them. The recent establishment of the well-equipped Government Laboratories in the Philippines are an example of what should be done, as their recent report is a proof of what can be done when the right men are given a free hand in a well-equipped Laboratory.

PREVENTIVE MEDICINE A FACTOR IN EMPIRE BUILDING.

In the course of responding to the toast of "Preventive Medicine and the State" at the recent banquet given to the Right Hon'ble Joseph Chamberlain by the Royal Institute of Public Health, the Prime Minister indicated that Preventive Medicine touched most closely the greatest internal and perhaps the greatest external problem with which we have to deal—the former referring to the dangers of the inevitable increase of the Urban population (under the unconquerable laws of economic destiny) being accompanied by deterioration in the physique and fibre of the race; and the latter to the necessity for rendering the conditions of life in the Colonies such as to mitigate the dangers which threaten the Europeans whose presence is necessary for the development of those countries.

Apropos of the external problem, while admitting that he could not imagine a less proper occasion for discussing tariff questions, he observed that if hostile tariffs had, in temperate regions, diverted the natural course of production, it was impossible that they should have the same effect where Nature had clearly said that there must be a great differentiation of production, or, in other words, hostile tariffs could not prevent there being a permanent difference and a material co-operation (as distinguished from a rivalry) as between the great tropical and the great temperate regions of the world.

We possess many of these great tropical regions and recognise that the best development of their extraordinary natural resources depends upon British superintendence, and Mr. Balfour pointed out that had not preventive medicine come to our rescue the blood tribute hitherto exacted from the British race by their acquisitions in unhealthy climates had been so great that it would have been impossible to turn such to the best account.

Mr. Chamberlain said that there had never been and never could be an Empire such as that for which we are responsible; that the work of the century upon which we have now entered is the consolidation of that Empire; and that while statesmen, pioneers, discoverers and conquerors have all done their part, the great assets of the British Empire are those of her sons who, in every part of the world, with a devotion above all praise, are quietly dealing with every conceivable problem of Government, with education, with trade, with health, and with those struggling contests which are a necessity of Empire, and which witness English officers, almost boys from school, leading native troops—who show them that devotion which they must have deserved—to victory in extraordinary emergencies.

For these men "who do so much for us" said Mr. Chamberlain, should everything be done to keep them in the vigour of life. For this reason he attaches so much importance to the investigations, the studies, and research, which he verily believes are going, in the course of time, to make those tropical climates, which have been each in their turn the white man's grave, places where white men can live in comfort; and in discharge of which almost unknown students working in laboratories in London, Liverpool, and elsewhere, might be doing more good for the Empire than any statesman has been able to do however high his position.

In the early seventies of the last century Mr. Disraeli spoke of the importance of sanitary reform as the foundation of every other reform, in a speeeh which at the time was the subject of some ridicule from Mr. Chamberlain and others; but Mr. Chamberlain now feels that sanitary reform is not unworthy of the attention of the highest statesmanship; that without it social reform is an empty phrase; and that the housing of the poor, the attempt to prevent the physical deterioration of the race, and all other things to which legislators devote such part of their time and attention as can be spared from party conflict, depend, and are founded upon, sanitary reform.

The branch of preventive medicine which enlists his warmest sympathies at present is that directed against the incidence of preventable diseases. These he characterizes as great agents for filling our workhouses, raising our taxes, weakening the fibre of the people, preventing us from successfully competing in the struggle for existence, which must go on as long as the world shall last, and for destroying more of our soldiers in war than do the bullets or swords of our enemies.

This testimony of Mr. Chamberlain who, in the words of the Duke of Abercorn who proposed his health, has done more than any of his predecessors to promote the health and increase the strength of his countrymen and fellow-subjects in the Great Britain beyond the seas, comes opportunely at a time when we are confronted by plague problems of quite unforeseen magnitude.

Year by year the pestilence gains strength, the dissemination becomes more wide-spread, and the movements of the infected more difficult to control ; and this, it is apt to be said, *in spite of all the measures which have been directed against it.* Yet who will dare even to conjecture what might have been the result had no measures been adopted ?

There is abundant evidence to indicate that the degree of dissemination bears a ratio which is inversely proportional to the stringency of preventive measures and time alone can confirm this.

For the present there are no signs of abatement nor any indication to justify the hope that such may be expected in the near future, but the utterances of these great statesmen, who necessarily have to keep in mind a wide perspective, should surely encourage us to renewed endeavour, and prevent us from under-estimating the true proportions and far-reaching effects of a growing calamity, merely because it is under our immediate gaze, and we are becoming accustomed to it.

LONDON LETTER.

THE IMPERIAL CANCER RESEARCH FUND.

THE third meeting of the Cancer Research Fund, in future to be designated by the prefix Imperial, took place at Marlborough House on the 8th of July under the Presidency of H. R. H. the Prince of Wales, who follows the excellent example of his Royal Father in the personal interest which he takes in Hospitals and Medical work.

The report and speech read and delivered on the occasion give evidence of sustained interest and industry in furthering the important object of the institution, which may be summarily defined as the discovery of the nature and cure of cancer. In addition to information regarding the administrative, statistical and financial affairs of the fund some scientific matter was produced by Dr. Bashford, the General Superintendent of a novel and highly valuable character The fact has been established by extensive observation that "cancer has been discovered to pervade the whole vertebrate kingdom and to present constant fundamental characters." This is a startling commencement. Search is now to be made for the existence of the disease in the invertebrate kingdom. Cancer has thus been added to those maladies which man shares with the lower animals and has been added to the large and growing domain of comparative pathology. The field of experimentation has been consequently opened, and a farm has been secured for the purpose of carrying out this fertile means of research. It has been found that cancerous tumours have been found to be capable of propagation by means of transplantation ; but only in animals of the same species from which the material has been taken. The active principle is the cancer cell, and this appears to be endowed with a faculty of conjugation or sexual fusion. The new growth is therefore of cytogenous origin and no evidence of bacteriological causation has been obtained. Investigation of the conditions affecting the vitality, infectiveness, fertilization and growth of the cancer cell are in progress, and especially of the possibility of preparing a serum capable of staying or aborting its multiplication ; some progress in this direction has been made and the cell has, by the addition of a serum *in cyatho*, been deprived of propagative power. Inquiries in this direction are to be continued with a hope that some day they may lead to the discovering of rational therapeutic methods. Cancer has been found to possess no specific symptomatology, and in a large proportion of cases even in London Hospitals the existence of the disease is only revealed by *post-mortem* examination, no indication of its presence having been revealed during life. The statistical evidence when read in the light of these facts is somewhat obscure, and the apparent increase of malignant desease in recent years is held to be due to improved means of identification, while differences in incidence in different races and communities are suspected to be due to variations in ability and means of recognition. Unfortunately no real advance has been made in regard to the cure of cancer and the old principal practice of early resort to operation still constitute the only hope of relief. Experiments on the power of radium bromide in abolishing the actvity of the cancer cell were negative. It is stated that the result of these is, so far, to how that "there is no ground at present for

predicting the curative effect of radium upon deep-seated primary tumours. The report does not deal with the use of rays or high frequency electrical currents. The association has extended its relations to other bodies and individuals, working on the same lines and with similar objects. These notes indicate that the work of this organization is of supreme importance and it is evident that the wider scope and more definite direction of this scientific movement must in time put the medical profession in possession of what it has so long and eagerly longed for—clearer views regarding the pathology of the disease and more effective means of dealing with it.

CHOLERA IN PERSIA.

Cholera is raging in Teheran and a daily death-roll of 900 is reported. There is an exodus from the town, and a difficulty is experienced in removing the bodies of the dead. The bazaar is closed and some quarters are deserted. Rigid quarantine measures have been established on the Russian frontier as regards traveller, merchandise and baggage; but it is very doubtful that these will prove effective. Europe has now enjoyed a long immunity from cholera. It seems as if the disease were on its way in a virulent form.

The Oxford Meeting of the Association was from every point of view an unqualified success. Apart from the objects of the gathering the attractions of Oxford are such as to ensure a large attendance, and nothing was wanting on the part of the Association officials, the university and the corporation to render this meeting thoroughly enjoyable and memorable. Upwards of 1,500 members attended, and they were mostly accompanied by their wives and daughters. Hotels, lodging houses and colleges were filled with guests and the streets were filled with a well-dressed and happy crowd, which divided its time between the business of the occasion, and entertainments, sight-seeing and excursions. Academical costume was generally worn at the more important functions, and the variety of shape and colour of gowns and hoods, together with the gay dresses of the ladies imparted brilliancy to these gatherings. The opening service in Christ Church Cathedral was very striking in this respect, the sermon was preached by the Revd. J. Franck Bright, D.D., Master of University College, a son of the celebrated physician of Guy's, whose name is so familiarly perpetuated in the Association with his discoveries in renal pathology. The address of the President, Dr. William Collier, had for its subject "the growth and development of the Oxford Medical School." It was a very appropriate theme and was ably handled. The story was one of early medical eminence, intermediate decadance of medical and scientific study, and recent revival in the face of crass conservatism and much opposition, both active and passive.

The University of Oxford has awakened to the necessity of the scientific education and its museums and laboratories bear evidence that the conviction has been realized that practical and experimental methods are the true secret of progress. The wealth and intellect of this great centre of culture has been too long wasted on infructuous pursuits, which may serve to elevate the tone and cultivate the taste of the community, but are hardly fitted to promote useful and productive knowledge. The intellectual and spiritual needs of society are of course of great—some would write supreme—importance, but the material and industrial interests and pursuits of mankind cannot be neglected, and the higher the cultivation of mind with which these are linked the better law and lessons of the most abstract and exalted kinds can be deduced from the study of nature in every field and phase, and a scheme of education which contents itself with languages dead and living, grammar, logic, philosophy and abstract notions of number and form seems strangely visionary and vain. The education imparted in a university ought to be of a universal character and be capable of useful adaptation to those pursuits which constitute the life—work of educated men—not only religion and law but medicine, engineering, agriculture and commerce. It is in this direction that universities are now tending. The subject of the address on medicine by Sir William Selby Church, Bart, President of the London College of Physicians, was the great thesis of *salus populi*, which has rightly been recognized as the *suprema lex*. Sir William MacEwen's address on surgery was more technical—perhaps too technical for a mixed audience. These addresses were delivered in the historical Sheldonian Theatre, which on each occasion was backed by a gay and appreciative audience.

CONVOCATION AND THE CONFERRING OF HONORARY DEGREES.

The holding of a convocation and the bestowal of honorary degrees upon several distinguished

members of the Association was an interesting episode of the meeting. This also took place in the Sheldonian Theatre. The recipients of the degree of D. Sc. *honoris causa* were Professor Clifford Allbutt, Mr. Andrew Clark, Chairman of the Council, D. T. D. Griffiths, retiring president, Mr. Jonathan Hutchison, Sir William MacEwen, Sir Patrick Manson, Sir John William Moore, and Professor William Osler. Each of these gentlemen was introduced to the Vice-Chancellor by a Latin speech delivered by Professor Love, setting forth their merits and achievements, and the degrees were conferred by the Vice-Chancellor with all the ancient ceremonies and customs.

THE NEW CONSTITUTION.

This was the first meeting at which the new constitution of the Association underwent a fair trial. The meeting of representatives of divisions was marked by great labour, and decided success, which was largely due to the able manner in which its proceedings were guided and controlled by the President, Sir Victor Horsley. The number of subjects—all of them intimately affecting the status and welfare of the profession—which were discussed was considerable. Conspicuous among them was medical defence, contract practice, the relation of doctor to midwives and nurses, medical legislation, vaccination, coroners' inquests, the amendation of laws and bye-laws, &c., &c. The relations of medical men to each other and to the public are discussed and defined by these proceedings and the ethical and legal aspects of our calling are made clear, while the new arrangements provide for a more general and authoritative declaration of the voice of the profession.

ENTERTAINMENTS AND EXCURSIONS.

Unfortunately the week after a long spell of brilliant summer weather, was a very rainy one, and this materially marred the arrangements made for the entertainment of members. These were planned on a large scale and included a reception at the University Museum by the Vice-Chancellor, a reception at Wadham College by the Oxford branch, a ladies' reception at New College, a reception by the Mayor, Mr. E. A. Bever, M.R.C.S., at the City Buildings, a garden party at Headington by Mr. and Mrs. G. H. Kirwell (M.P.), at the Warneford Asylum by Dr. and Mrs. Neil, and at Blenheim by the Duke and Duchess of Marlborough. Notwithstanding the rain these entertainments and several excursions were numerously attended and greatly appreciated.

THE SECTIONS.

The scientific work of the meeting was carried on by the fourteen sections which met simultaneously for three hours on three days and engaged actively in appropriate discussions and the hearing and criticising of papers. I devoted myself to the section of Tropical Diseases which, under the able guidance of the President, Lieutenant-Colonel Alexander Crombie, M.D., accomplished much solid and instructive work relating to the causation and etiology of sleeping sickness, the prevention of malaria, the significance of the Leishman-Donovan bodies and many other subjects of interest to medical men practising in the tropics. An admirably stocked and arranged pathological museum was most attractive and improving, and there was also an extensive display of medicines and appliances which brought practitioners and suppliers into easy and serviceable communication.

WHY HAS CALCUTTA NOT GOT A DIVISION OF THE B. M. A. ?

This is a question which I have mooted in previous letters. The Capital of the Indian Empire aught assuredly to organise a division of an association which has now become imperial in its dimensions and connections. In no other way can the medical profession in India become so intimately and profitably associated with the medical profession in the parent country as this. The importance of establishing a bond of this kind has been realized by most of the colonies, and even in some parts of India; but as long as the Capital of India remains unrepresented in the council of this great organization, a serious defect must remain in its imperial character. Medical men in this country would, I feel assured, warmly welcome the entry of their Indian brethren into the fold of the association. And the formation of an Indian branch, with divisions in the larger towns, would supply a means of social and professional union and scientific improvement of the utmost value. The reconstitution of the association on a broader and more popular basis and the new and promising start which has in consequence been made in stirring up the profession to a livelier sense of its wants and responsibilities seem to offer a suitable opportunity for reviving a society which at one time seem-

ed to possess strong vitality but became and has remained dormant and torpid through circumstances that need not then, and certainly should not now be a bar to resuscitation. I venture to suggest that the *Indian Medical Gazette* should advocate and press this important suggestion.

THE MALTA FEVER COMMISSION.

The Royal Society, which has recently been the instrument of getting such excellent work done by means of specially skilled agents, with reference to malaria and sleeping sickness, has appointed a Commission to investigate the etiology and pathology of Mediterranean fever. The members are Colonel Burce, F.R.S., R.A.M.C., the discoverer of the *Micrococcus melitensis*, Major Horrocks, R.A.M.C., lately Assistant Professor of Hygiene, Staff Surgeon Shaw, R.N., Dr. Tammitt, Chemical Analyst and Bacteriologist to the Government of Malta and Dr. Ralph Johnstone of the Local Government Board. The Commission has already commenced its work in Malta. It is to be hoped that it will take the case of India into its consideration; for the question of whether cases of Mediterranean fever occur in India is an unsettled one and it is highly desirable that it should obtain an authoritative reply for or against.

APPOINTMENT OF PROFESSOR OSLER TO OXFORD.

It is announced in this morning's paper that Professor William Osler has been selected to the Chair of Medicine in succession to Sir John Burdon Sanderson. Osler's reputation is world-wide and the revival of the Oxford Medical School, to which reference has been made, will be materially stimulated by the efforts of so distinguished and progressive a man.

17*th August* 1904. K. McL.

Current Topics.

OUR NEXT SPECIAL NUMBER.

Owing to the liberality of Messrs. Thacker, Spink & Co., the proprietors and publishers of the *Indian Medical Gazette*, we are enabled to announce that a Prize of Rs. 100 (one hundred rupees) will be given for the essay or original article deemed best by a Committee of Examiners in our next special number. The subject will be

Dysentery.

The etiology, prevention, clinical history, pathology and treatment should be dealt with, or any one of these subjects may be taken as the subject of the article.

Further details will be announced in a subsequent issue.

The special number will, it is proposed, be published in June 1905.

THE CULTURE OF THE DONOVAN BODIES.

The following is a copy of Capt. L. Rogers' account of his successful experiments on the development of trypanosomes in cultures of the Leishman-Donovan bodies :—

"The Cunningham-Leishman-Donovan bodies found in the spleens and other organs in cases of cachexial fever (previously known as malarial cachexia) present evident characteristics of protozoal parasites, although the exact class to which they belong is still disputed. Recent successful cultivation of another protozoal parasite—namely, the trypanosoma—led me to try to get the former organism to live and to multiply outside the body, in order to allow of its life-history being more closely studied. For this purpose I placed infected blood obtained from the spleen during life in small tubes with a little citrate of soda solution to prevent the blood clotting and kept it under varying conditions. First, they were incubated at 37° C., but it was found that even when numerous in the original blood they had nearly completely disappeared within 24 hours, only a few lightly staining evidently degenerate forms remaining. It, however, occurred to me that in the case of the trypanosoma the organism had been found to live longer outside the body when kept at lower temperature than it did at blood heat, so I placed some similar culture tubes in an incubator at a temperature of 27° C. I then found that the organisms retained their natural characteristics for several days and in blood films made from the tubes they stained quite as well as in the blood freshly taken from the spleen during life, while not only were they in undiminished numbers but they were actually more numerous than before. At first I thought this might only be an apparent increase, as the number of parasites found in two slides made at the same time from fresh blood may vary considerably, but by repeating the observation a number of times I have been able to get conclusive evidence that an increase in the number of the organisms had actually taken place in the culture tubes.

This evidence is of two kinds. First, films were made each day from the fluid blood medium and the number of organisms found in many fields in various parts of the specimen was noted, and it was found that even when they were scantily present in the freshly taken blood they could be found in much larger numbers after from one to three days' incubation at from 22° to 27°C., while in some instances, in which they had been numerous in the fresh blood, two or three being found in a single field, after one or two days they had become so numerous that from 50 to 100 have been counted in a single field of an oil immersion lens. Secondly, and of still greater value, is the fact that in the films made after incubation forms, showing various stages of subdivision, were relatively very numerous, while in those specimens which originally showed a large number of the organisms, enormous numbers of the smallest forms were found, many of them in clumps of from 10 to 20 or more, several of which were often seen within a single field of an immersion lens. Around these very numerous forms of varying sizes were scattered so thickly as to look as if they had been sprinkled from a pepper-pot, as was remarked by one medical man on seeing them. Now it is a very marked feature of films made from freshly drawn spleen blood that the proportion of forms undergoing subdivision is extremely small, so that a good deal of search through specimens showing numerous parasites is necessary in order to make out different stages of the subdivision, such as I have already

described in a former communication, and Lieutenant R. S. Christophers, I.M.S, also remarks on the rarity of these forms in ordinary spleen puncture films Yet in my specimens from the culture tubes it is quite common to see a number of dividing forms in varying stages in a single field of the microscope, and I have met with fields showing nearly complete series of these forms. In such specimens it is easy to make out two methods of multiplication of the parasites. In one form the typical oval organism with a large and a small nucleus enlarges to beyond the usual size, then each nucleus divides once, so that two large and two small nuclei are present in a single cell, after which the cell itself divides into two, the point of division being at one end, so that just before the final separation the other ends alone remain united. A second mode of division, which evidently accounts for the very numerous new small forms of the organisms which are very rarely seen in fresh films, commences very much as I described in my former paper by the nuclei undergoing multiple division, until a number of them are seen in a single cell. Next in the culture a kind of slimy zooglea mass is formed, the outline of the original parasite having disappeared, and the minute multiple nuclei appear to sort themselves out in pairs of a large and a small nucleus, which gradually increase in size but have as yet no capsule. When they reach a certain dimension, which is smaller than the usual form found in spleen puncture blood, a capsule appears around each, forming a characteristic group of complete young parasites, such as occurs in fresh spleen blood. It is worthy of note that in these specimens the blood corpuscles have nearly or entirely been dissolved and have therefore disappeared, so it is quite certain that the forms of subdivision just briefly described take place outside the red corpuscles and in no stages have they been observed within them. It is clear, then, that the parasites are not piroplasmata.

As I found the organisms died out within a few days at 27° C. I next tried a temperature of 22° C. and soon found that it was more suitable for their growth, as even when very few in the freshly drawn blood they were found in much larger numbers within a day or two Further, a number of larger forms than I had seen in the fresh blood appeared in the citrated blood at this temperature, which led me to look out carefully for flagellated bodies, as the two nuclei of different sizes suggested to me a resemblance to trypanosomes, just as it did to Leishman before. This search was soon rewarded by my finding fully developed trypanosoma in two cases in the cultures. They were best developed in a spleen blood after one day's incubation, although only the usual oval forms were found in the freshly-drawn blood, and showed many forms undergoing longitudinal splitting, with double flagellæ macro- and micro-nucleus complete, together with pear-shaped flagellated forms exactly similar to those described by Plimmer in trypanosoma of tsetse-fly disease. The other case, fortunately, was one of kala-azar from Assam, for the spleen blood of which taken by puncture I am indebted to my assistant, Assistant-Surgeon G. C. Chatterjee. In cultures of this many intermediate forms and a few complete trypanosoma were found. Thus this new human trypanosoma has been obtained by culture of the bodies found in the spleen by Leishman, so that the latter must be one stage in the life-history of the organism and not degenerated forms as he at first thought them to be. Further, they have already been obtained from both the endemic form of cachexial fever seen in Lower Bengal and also in the Assam epidemic form known as kala-azar. It is worthy of note that Assistant-Surgeon Chatterjee found a living trypanosome in an anopheles mosquito some time ago,* while I am also indebted to him for help in the microscopical examination of my cultures. I hope to be able to publish illustrations of the different stages of the development of the trypanosome at an early date.

* *Indian Medical Gazette*, 1902.

A DYSENTERY EPIDEMIC.

We are indebted to the *Journal of the American Medical Association* for the following account of an epidemic of dysentery in Metz:—

"Conradi's recent study of what he regards as a contact epidemic in Metz, in Alsace-Lorraine, appears to bring to light points of great interest in regard to the genesis and history of dysentery. In the course of two months there appeared in Metz and vicinity 70 cases of a mild form of bacillary dysentery. There were only three deaths. Conradi examined 60 cases bacteriologically, and in the fæces of 56 he demonstrated the presence of virulent bacilli of the Shiga-Kruse type, which were agglutinated by immune dysenteric serum. He could find no bacilli in the blood or urine of these patients. In the clumps of bloody mucus of the early cases the bacilli were often present in pure culture; in older cases it was necessary to carefully wash the masses of mucus before cultures were made from their interior. Conradi succeeded in recovering bacilli from the fæces in 27 old cases, in the second to the fourth week after the attack, cases which, without the result of the examination of the fæces, would have been regarded as healthy and free from all danger. *Hence dysenteric patients may remain infective for one to four weeks, and perhaps longer, after an attack* Conradi also found dysenteric bacilli in the fæces of five healthy children in Metz. *These facts give us some idea of the manner in which the disease may be conveyed*, and also of the difficulties in the way of its control. Anent this phase of the matter it is noteworthy that extensive epidemics of dysentery have been imported by the return home, for instance, of sailors with dysentery. An epidemic in Norway, in 1859, has been traced definitely to the return of a sailor who had been treated for dysentery in Liverpool. The disease spread from the home of this sailor and attacked in all 3,992 persons, of whom 621 died (15·6 per cent. mortality).

Conradi regards the epidemic in Metz as a "contact epidemic," because the disease occurred especially in the crowded homes of the poor, in which the sanitary arrangements were very primitive. Often there were several cases in the same house, the disease beginning in children and later attacking adults.

This Metz epidemic is interesting also from the historical point of view, because it appears to be the last outbreak of a long series which can be followed for some 1,500 years. These epidemics about Metz have been made the subject of special study by Maréchal and Dideon, who describe distinct outbreaks in 586, 1539, 1552, 1621, 1770, 1783, 1792, 1835, 1844 and 1870. During the siege of Metz in 1870 there developed, from August to October, 19,135 cases of dysentery in the besieging (German) army and 3,500 cases in the besieged. Since then sporadic cases have occurred from time to time. There was an epidemic of dysentery in Metz again in 1888. Under these circumstances one would expect the influences of immunity to make themselves felt, and Conradi believes that this is evident from the fact that of the 70 persons concerned in the last outbreak those over 25 years of age were immigrants, not a single aboriginal inhabitant older than 25 being attacked. Certainly this adds force to the natural inference that the Metz epidemics have been outbreaks of the same disease. It would appear that *in the prepetuation of a disease in this manner the harboring of bacilli in the fæces of healthy individuals must be an important factor.* This may help to secure the viability of the infecting agent until such time as conditions arise that are favorable for the development of more or less extensive outbreaks."

EPIDEMIC AND EPIZOOTIC DIPHTHERIA.

In an article in the Journal of Comparative Pathology and Therapeutics (March 1904) on an outbreak of diphtheria at Muktesar (Himalayas) associated with a similar disease among

fowls, and a vesicular eruption on the udders of cows, Lieut. J. D. E. Holmes, Indian Civil Veterinary Depatment in citing the results of experiments by Dean, Todd, Bowhill and Klein, in support of the theory that the cow is capable of becoming an active agent in the dissemination of the disease, suggests that cows probably take up some organism, a facultative agent of human diphtheria, from the soil with their food; that this organism causes cough, and eruptions on the teats and udders, and that by the passage through their bodies it acquires further powers and facility for acting on human beings.

He points out that, in view of this hypothesis, it would not necessarily follow that the organism, which is the primary agent of the disease in the cow, is morphologically identical with the Klebs-Löffler bacillus; nor would it be necessary for it to display the same virulence for animals as that recovered from the human body.

As regards the relation of avian to human diphtheria, a subject which has for many years excited controversy among scientists, and still continues to do so—after briefly alluding to the opinions of Nocard and Löffler (who consider the bacillus of avian diphtheria to be analagous to that of septicæmia); of Moore (who has described a pasteurella identical with that of fowl cholera); of Boing, Hingworth, Bilhaut and Esmmerlich (who have cited instances in their experiences of direct transmission of diphtheria from fowl to man) etc.,—he details the results of the observations of Guerin, who is perpaps the latest worker in this field. These indicate that human diphtheria is entirely distinct from that of the fowl, the infective agent of the latter being a pasteurella; and that organisms morphologically resembling the Klebs-Löffler bacillus, which he, on two occasions, isolated from the pseudo-membrane of an affected fowl, are identical with the pseudo-diphtheria bacillus frequently found in the throats of healthy human beings, and which he considers to have no connection with true diphtheria.

In the last assumption Guerin, while in agreement with some observers, *e.g.*, Löffler, Hofmann, Graham Smith, and Corbett, traverses the more generally accepted view that the pseudo bacillus is merely the Klebs-Löffler bacillus in an attenuated condition, and, as such, non-pathogenic for animals.

Roux and Tersin share the latter view and have succeeded, by growing the Klebs-Löffler bacillus under unfavorable conditions, in obtaining a non-pathogenic bacillus. Hewlett and Knight state that they have transformed the virulent into a non-virulent type and *vice versâ*. Richmond and Salter record that they have converted the pseudo into a virulent type by repeated passages through certain birds. Sternberg, in his Text-book on Bacteriology, writes—'the fact that the non-virulent type is very rare n fatal diphtheria, and more common in benign cases, that it becomes more common in severe cases as they tend towards recovery and that it is more observable in persons who have recently had diphtheria than in healthy individuals, renders the idea that the two microbes are entirely distinct difficult."

It is, therefore, extremely likely that the co-existence of an outbreak among fowls, animals, and human beings was more than merely co-incidental.

As regards the distribution of the bacillus in the body, Lieut. Holmes, while referring to the old belief that diphtheria was a purely local disease, and that the specific agent was to be found in the false membrane alone, cited the observations of Wright, Trosch, Kartach, Stephens and others, who have demonstrated the Klebs-Löffler bacillus in the heart's blood, lungs, spleen, lymphatic glands, and kidney, in fatal cases; of Abbott, Shrisky, and Tarnik, who have recorded that, in exceptional instances, the bacilli when deposited under the skin of the smaller animals may be found in the lymphatic apparatus of the omentum; and of Klein who found that when cows are inoculated sub-cutaneously, diphtheritic lesions may appear in distant areas, and the bacilli may escape with the milk.

In the experiments recorded in the paper, among the animals inoculated with human diphtheria, and also among those inoculated with avian diphtheria, and which succumbed, in almost every instance the bacillus was observed in œdema, heart's blood, spleen, liver, and kidney. The forms varied in different animals and different tissues, and were not of very typical shapes. In blood serum cultures they reverted to more typical forms, and when tested on animals, they proved equally virulent as the original diphtheria culture.

EPIDEMIOLOGY OF ENTERIC FEVER AND CHOLERA IN HAMBURG.

In a lengthy article on the above subject in the *Lancet* (23rd April 1904), Dr. Reincke, M. O. H., Hamburg, points out that enteric fever and cholera epidemics repeatedly coincide with one another, a fact which is not to be wondered at in face of the great similarity of their modes of spread. "Not only," he writes, "do both seek out similar localities, in which insanitary conditions exist in connexion with the excrement disposal, and the water-supply, not only are both associated in their spread with water, but also dry years and dry seasons with low level of subsoil water are favorable to the development of both diseases."

It has repeatedly been observed in Hamburg that in the years in which outbreaks of both diseases have occurred simultaneously, enteric fever has always broken out from two to three weeks later than cholera, corresponding to the different lengths of the period of incubation.

Dr. Reincke considers that a similar connection exists between these two diseases and choleraic diarrhœa, particularly noticeable in the case of illnesses arising from the consumption of oysters from sewage-contaminated oyster beds. Some persons are attacked by choleraic diarrhœa soon after eating infected oysters, others get enteric fever two or three weeks after, and others again suffer from both.

Dr. Bulstrode has reported similar observations at Winchester and Southampton, and confirmatory evidence has also been recorded in connection with the Stralaus waterworks in Berlin. Concluding, the writer forcibly indicates the prominence which should be given to efforts to secure a pure water-supply in the war against enteric fever and cholera and incidentally against choleraic diarrhœa.

THE JOURNAL OF THE MALAYA BRANCH, B.M.A.

We have received a copy of the *Transactions* of the Malaya branch of the British Medical Association, which contains a large number of really valuable and useful articles on many diseases of the tropics.

Dr. M. Watson has an article on quartan malaria, in which the diagnosis was made by an examination of the blood, but in which "the extraordinary periodicity which gave a name to the fever in ages gone by was absent in no less than 60 per cent. of cases."

Quartan fever, according to Dr. Watson, is remarkable in that the fever often passes off by itself by rest in bed, but it is very frequently followed by the symptoms familiar to us as malarial cachexia, œdema, anæmia, diarrhœa and dysentery, pulmonary complications.

In another paper Dr. W. R. C. Middleton has a note on the local consumption of alcohol by Europeans in Singapore, or rather by members of four clubs in that city, during a period from April to August. Dr. Middleton concludes that the bad effects of alcohol on the constitution of Europeans in the tropics is probably exaggerated, and the results based on cases of over-indulgence, and he hints that the results of over-eating (usually seen, says he, in teetotallers), as likely to be bad as a moderate use of alcohol.

Another very interesting article, by Dr. Lim Boon Keng, M.B., C.M. (Edin.), is on tuberculosis among the Chinese in Singapore. The disease is certainly common, but practically pulmonary phthisis is the form usually seen. Lupus or any form of superficial tuberculosis is certainly rare, struma with caries of bone is extremely rare. Tubercular meningitis is also rare, while pulmonary tuberculosis runs riot in families and often decimates them, probably this is largely due to the reckless way patients discharge their expectoration. Dr. Lim Boon Keng has obtained encouraging results from the open air treatment even in the damp and relaxing climate of Singapore.

Dr. F. W. More writes of the reappearance of dengue in Singapore, after 30 years, in the autumn of 1901. It will be remembered that shortly after this, the disease appeared in Burma. The Singapore epidemic was a serious one. This epidemic is supposed to have originated in Java, and rapidly followed trade-routes to Malaya, China, Siam, Japan and, we may add, Burma. Dr. More gives three types of rash, the primary being usually only a simple erythema, rarely lasting more than two or three days. The secondary rash appeared about the fifth or sixth day in 86 per cent. of the Singapore cases, it lasted for about 48 hours, and was entirely absent in only 2 per cent, of cases. The three varieties are given as follows:—

(1) Measly or maculo-papular;
(2) The milarial
(3) Urticarial, with excessive itching,

The mortality of dengue was extremely low.

Major J. Ritchie, M.B., R.A.M.C., has a very useful article on the fevers of West Africa.

We look forward to seeing the regular publication of the transactions of this flourishing branch of the British Medical Association.

THE COMPLICATIONS OF DYSENTERY.

Dr. C. F. Craig, the Pathologist to the Army General Hospital, San Francisco, has published a valuable article on the complications of dysentery as observed at *post-mortem* examinations. He considers that sufficient attention has not been paid to these complications in the descriptions of the disease in ordinary or even special text-books.

Dr. Craig divides dysentery into two kinds: (1) specific, or bacillary, which includes the chronic form of the acute dysentery due to the bacillus of Shiga, and (2) the amœbic. The specific form is "differentiated from the amœbic by the absence of amœbæ in the fæces, and in a majority of cases by the occurrence of agglutination of a pure culture of the Shiga bacillus by the blood serum of a patient suffering from the disease or by the isolation of the bacillus from the fæces or from the intestinal ulceration."

When, however, we come to the autopsy table, says Dr. Craig, the two forms of dysentery are so different that there can be no mistake in deciding with which we have to deal.* The writer then mentions that whereas in 1899 and 1900 the type of dysentery studied in the Philippines was specific dysentery, now the cases received into hospital are chiefly of the amœbic variety. As to

* This distinction, as observed *post-mortem*, has already been pointed out some years ago by Leonard Rogers in Calcutta.—Ed., *I.M.G.*

complications, Dr. Craig states, that in amœbic dysentery "an intense congestion of the blood-vessels of the cerebrum" is peculiar. In the respiratory system the most common conditions found were emphysema and broncho-pneumonia, these being most common in the bacillary form of dysentery. The broncho-pneumonia is really hypostatic in origin and we doubt if it has anything special or specific in its nature. Other varieties of pneumonia are also common, and all varieties are most dangerous. In the circulatory system the most common and fatal complication was œdema of the pericardium. The most common of all complications of our author in dysentery is nephritis, though other authorities have stated it to be very rare. Craig calculates that sixty per cent. of the thousands of cases which passed through the General Hospital at San Francisco showed evidences of inflammation of the kidney, and he thinks that this complication is more common in the amœbic variety. In the liver our author finds chronic venous congestions, and cirrhosis, as well as, the most important of all, abscess of the liver. We may quote the remarks on this point *in extenso* :—

"*Abscess of the Liver*.—Undoubtedly the most important complication of dysentery, that is, of the amœbic form, is abscess of the liver. This condition was observed in 24 cases which came to autopsy, of which 22 were suffering from amœbic dysentery and 2 from the chronic specific form. The abscesses occurring in the chronic specific form were metastatic in character, the liver being thickly crowded with minute foci of suppuration.

The frequency of the occurrence of amœbic abscess of the liver in dysentery seems to vary greatly with different observers, as is well shown in the following table. The total number of cases of dysentery observed at autopsy or collected from autopsy records (with the exception of Councilman and La Fleur and Futcher, who give all cases observed) by the different investigators is given, followed by the percentage of those presenting abscess of the liver. All the cases given in the table as observed by myself were amœbic in character, the *amœba coli* being demonstrated in the fæces

Observers.	No. of cases observed.	Percentage.
Kartulis ...	Over 500	60
Zaucarol ...	... 444	59
Edwards and Waterman	... 699	72·1
Councilman and La Fleur	... 1,429	21
Craig... ...	... 74	33·7
Futcher ...	... 119	22·6
Smith ...	... 45	84·4

As will be seen from the above table, the percentage of cases of dysentery showing abscess of the liver at autopsy, as observed by myself, has been very small compared with that observed by others. I can hardly tell how to explain this difference unless most of the cases of amœbic abscess are discovered in the Philippines, and either end fatally there or are operated upon before reaching this country, whereas the vast majority of cases of dysentery not presenting this complication are returned to this country for convalescence.

As regards the location of the abscesses, it may be stated that they occur most frequently in the right lobe, especially in the posterior and upper portion of that lobe. The following table, showing the location of the abscesses observed in cases coming to autopsy here, illustrates this point very clearly :

Number of case.	Abscesses.			
	Single.	Multiple.	Number.	Location.
1	...	Yes	6	Right lobe 5, left lobe 1
2	...	,,	8	,, ,, 8, ,, ,, 0
3	...	,,	4	,, ,, 3, ,, ,, 1
4	...	,,	13	,, ,, 8, ,, ,, 5
5	..	,,	8	,, ,, 8, ,, ,, 0
6	Yes	...	1	,, ,, 0, ,, ,, 1
7	,,	...	1	,, ,, 1, ,, ,, 0
8	...	Yes	2	,, ,, 2, ,, ,, 0
9	Yes	...	1	Lobus Spigelii.
10	...	Yes	17	Right lobe 16, left lobe 1
11	...	,,	too numerous to count	In both lobes.
12	...	,,	10	Right lobe 2, left lobe 8
13	Yes	..	1	,, ,, 1, ,, ,, 0
14	...	Yes	3	,, ,, 3, ,, ,, 0
15	..	,,	5	,, ,, 5, ,, ,, 0
16	Yes	...	1	,, ,, 0, ,, ,, 1
17	..	Yes	3	,, ,, 3, ,, ,, 0
18	Yes	...	1	,, ,, 1, ,, ,, 0
19	,,	..	1	,, ,, 1, ,, ,, 0
20	...	Yes	very numerous	Right lobe, all but 2.
21	Yes	...	1	,, ,, 1, left lobe 0
22		.	30	,, ,, 23, ,, ,, 7
23	...	Yes	4	,, ,, 4, ,, ,, 0
24	Yes	..	1	,, ,, 1, ,, ,, 0

In those cases which showed multiple abscess of the liver it was almost invariably found that the oldest abscesses, as shown by their size and the thickness of the abscess wall, occurred in the right lobe posteriorly or near the dome. In only one case of multiple abscesses observed did the pathological findings seem to indicate that the abscess formation commenced first in the left lobe. My experience, as given in the above table, is well borne out by the collective investigation made by Roux as to the location of liver abscesses in amœbic dysentery. He collected 639 cases with the following result : 435, or 70 8 per cent., were situated in the right lobe ; 85, or 13·3 per cent, in the left lobe ; and 2, or 0·3 per cent. in the lobus Spigelii. A study of my cases, as given in the table, will also show that the majority of the cases showed multiple abscess, thus proving that the general opinion that amœbic abscess is nearly always single is a mistake. In fact, some authorities have counted several thousand abscesses in the liver and have separated amœbæ from these abscesses. I have seen instances in which the abscesses were too numerous to count.

Rupture of a liver abscess is of comparatively frequent occurrence, the perforation taking place into the abdominal cavity, the pleura, the pericardium, or into any of the adjacent viscera. In 24 cases observed here, seven were accompanied by rupture, perforation occurring in

the following localities: Right pleural cavity, five cases; left pleural cavity and the pericardial cavity, two cases. As the location of the rupture of amœbic abscess is of great surgical importance, I have prepared the following table giving the results of various observers as regards this question :—

Observers.	Case of liver abscess.	Case of rupture.	Pericardium.	Pleura.	Lung.	Colon.	Stomach.	Bileducts.	Venacava.	Kidney.	Lumbar region.
Waring ...	300	68	14	28	15	2	1	1	3	2	2
Dutroulau ...	66	25	2	10	7	1	1	..	..	..	4
Roux ...	162	54	11	17	14	3	6	2			
Haspel ...	25	6	4	2							
Cambay ...	10	3	...	2							
Howard ...	6	5	5	...							
Craig ...	24	8	and Pleura 2	5	...	...	...	...	...	...	1

In one case observed at this hospital an amœbic abscess of the liver was operated upon successfully, in which no history of a previous attack of dysentery could be obtained. That an amœbic abscess can occur primarily in the liver without a previous dysentery, has been established beyond a doubt by a case reported by Buxton of a woman dying at the Philadelphia Hospital in which the autopsy showed four large abscesses in the right lobe and one in the left lobe of the liver, the pus of each containing amœbæ, although the large and small intestines were absolutely normal in appearance. In all probability, the case which I have just mentioned is a similar one to that of Buxton.

It is not my intention here to discuss the etiology of amœbic abscesses further than to say that they are, without doubt, due to the infection of the liver tissue by the *amœba coli*, probably reaching the organ through the portal vein, although Councilman thinks that they reach the liver through the peritoneal cavity after penetrating the intestine. Other authorities regard the lymphatics as responsible for the liver infection.

Bacteriological Examination.—In all the cases which came to autopsy, sections were made of the walls of the liver abscesses, and in the majority of cases amœbæ were demonstrated. An examination of the pus from the abscess cavity did not result, as a rule, in a demonstration of amœbæ unless it was removed by scraping from the abscess wall. By the later method amœbæ were demonstrated without difficulty. A bacteriological examination of the pus by means of cultures resulted in about 50 per cent. of the cases showing a mixed infection with some other organism, principally staphylococci, streptococci, or the *bacillus coli communis*. My observations as regards the bacteriology of the pus in liver abscess confirms that of many other observers who have found that in about one-half the cases there is a mixed infection. It is in these cases, also, that we find the yellow or greenish pus, rather than the reddish or chocolate-coloured pus, which is so typical of amœbic infection.

DIRECTIONS FOR PRESERVING FILARIAE.

Dr. Nuttall, F.R.S., publishes the following methods for use of medical men in the tropics :—

Embryos in the Blood.

"(1) Drop blood into a solution of 1 in 4,000 perchloride of mercury in 8 per cent. saline Mix by shaking, cork and send without more ado.

(2) Drop blood into solution of iodine added to 8 per cent saline, in quantity sufficient to give saline a pale sherry colour. Mix, cork and send.

(3) Drop blood into 10 per cent. boiling formalin solution, allow sedimentation to take place, then decant and preserve in 5 per cent. formalin.

(4) Make blood smears on cover-glasses, dry, pack them back to back, surround with thin paper (paraffined better), put into small box into which paraffin, melting at not too high a temperature, say 50—60° C., has been poured Now pour in fresh melted paraffin so that cover-glasses lie in a block of paraffin.

Note.—I have devised this method in the hope that it will work with films collected in the tropics, excluding their growing mouldy and altering with regard to stains. I should like to see it tried.

Adult Filariæ.

(1) Place worms in saturated perchloride of mercury for twenty-four hours, then rinse with water for thirty minutes, and place in 70 per cent spirit to which a little iodine has been added, so as to give it a sherry colour. Cork and send.

(2) Place worms in dish, pour on boiling saturated perchloride, rinse as before and store in iodinised 70 per cent. alcohol.

(3) Drop worms direct into 4 per cent. formalin in 8 per cent. saline; cork and send.

The different methods can be used according to the convenience of the worker."

There has been within the past year quite an epidemic of new medical journals published in India. The last two we have seen are *Indian Public Health*, edited by Dr. Newell, which is proposed as a medium for the discussion on all Public Health questions in India. The first number is promising and discusses several subjects of great interest and importance. The second publication is *Practical Medicine*, edited by Dr. Ram Narain, L.M.S. (retd.), and emanates from Delhi. It has now reached the second volume and may therefore be presumed to have become established. It has but few original articles, and largely consists of medical news and extracts from the medical press.

Major C. Donovan, I.M.S., has recorded the following note on three cases of leucocythæmia:—

"Three cases of this interesting disease were admitted in the native wards; two from Salem district and one from Madras.

The diagnoses were made by examination of stained (Jenner and Ehrlich's Triacid) specimens of the blood. No definite cause could be discovered for this ailment; all of the lienomyelogenous type, with huge spleens. The blood was carefully examined for Löwit's parasite, but without success. Treatment was of no beneficial effect.

I give here the results of the examination of the blood of one of the cases:—

Differential leucocyte count—			
Polymorphonuclear	...	20·3	per cent.
Mononuclear	...	3·08	do.
Transition	..	0 92	do.
Lymphocyte	...	2 61	do.
Eosinophile	...	1·40	do.
Mast cell	...	18·47	do.
Myelocyte with granules	...	7·84	do. } Myelocytes = 53·32 per cent.
Myelocyte without granules		30·20	do.
Eosinophile Myelocyte	...	9·84	do.
Stamm Zellen	...	5·44	do.

The number of red blood corpuscles was 2,712,000 in the cubic millimetre, and the leucocytes were 267,000."

Busck [*A. J. Med. Sci.*, June] reviews the work done in this connection by King, Harrington, Leaming, and others, and arrives at the conclusion that the cause of the special effect of quinin preparations on malarial patients lies in the power of these preparations to make the plasmodia sensitive, so that they are destroyed or weakened under the effect of daylight. He bases his supposition on the following: 1. The special effect of quinin in malaria can hardly be explained entirely as a direct outcome of its toxicity with regard to plasmodia, and if we look for an explanation of this effect we must not leave out of consideration a peculiarity so distinct as the power to make micro-organisms sensitive to light. 2. Quinin preparations have decided sensitiveness-arousing qualities, as was shown by Ullmann. 3. According to Jacobson and Dreyer, light, even after passing through a layer of animal tissue, can exercise its microbicidal effect on the sensitive-made organs. The depth of penetration, of course, depends on the intensity of the light. 4. The tissues of the human body are pellucid, and even if only a comparatively small portion of the surface of the body is exposed to light, the blood, and with it the plasmodiæ, will, on account of its continuous circulation, all the same be affected by the light. 5. If these premises are correct, they indicate the advisability of treating malarial patients with sun baths or electric-light baths in addition to quinin.

We have received a large number of annual Sanitary and Hospital Reports,—which we hope to review in our next issue.

In the report of the Royal Commission on Sewage Disposal, Vol. iii, p. 171 (vide *Journal of State Medicine*, June 1904) certain tentative standards are suggested solely for comparative purposes, *viz.*, (1) to object to a water containing *B. coli* in i.c.c., or spores of *B. enteritidis* sporogenes in 10 c.c.; and (2) to reject oysters containing 1,000 (lenient standard) or 100 (stringent standard) *B. coli*, or 100 (lenient standard) or 10 (stringent standard) spores of *B. enteritidis* sporogenes respectively, per oyster, subject always to the examination of a number of samples, and to the interpretation of the results of the *B. coli* test in the light of a knowledge of the biological attributes of these microbes.

Dr. Weir Mitchell of Philadelphia announced at a recent meeting of the Association of American Physicians at Washington, that Dr. Noguchi of Japan had succeeded in preparing a serum which was capable of neutralizing twelve times the lethal dose of rattle-snake venom in guinea-pigs. Dr. Noguchi's researches have for several months been conducted in the Serum Institution in Copenhagen under a grant from the Carnegie Institution. "The fact that the announcement of the discovery was made by Dr. Weir Mitchell," writes the *British Medical Journal*, "is of particular interest, as more than forty years ago that distinguished physician worked long and unsuccessfully at the problem which Dr. Noguchi now claims to have solved."

Captains W. S. Harrison, and L. W. Harrison, R.A.M.C., have published a valuable note of experiments on the effects of drying and sun exposure on the typhoid bacillus, and their conclusion is:—"That typhoid bacilli will survive, potent for mischief, in Indian dust and under an Indian sun sufficiently long to be blown through and through barracks and camps, when deposited on the ground in the form of typhoid-infected urine or blown as infected dust from the dry earth used in the latrines. The practical importance of these facts in relation to conservancy in India is obvious."

In the July No. of the *Journal of R. A. M. C.* Captain E. Blake Knox, R.A.M.C., has a valuable article on the spread of typhoid fever by the urine, and strongly urges the use of urotropine in 10-grain doses three times a day, and in the urine clear and during convalescence.

A Commission under the auspices of the Royal Society is now working at Malta on the etiology of Malta fever.

The following extract sums up the views of Dr. J. L. Miller of Chicago on the value of Kernig's sign in meningitis:—

1. A maximum angle of 115 degrees gives more valuable results than does an angle of 135 degrees, as proposed by Kernig.
2. The angle obtained in any individual case depends, in part, upon the force used in extending the leg, and for this reason actual measuring of the angle is not essential.
3. The sign is present in a large percentage of the cases of meningitis; it is, however, not constant, may be transitory, or only appear late; therefore, daily examination should be made for its presence.
4. It is present in a typical manner, occasionally in a number of widely different disease conditions, and for this reason it is probable that there is not a uniform cause for the sign.
5. The sign is occasionally unilateral, exclusive of cases of hemiplegia or local trouble, which might explain its unilateral presence.

6. The presence of the sign in cases of suspected meningitis is merely another factor favouring the diagnosis. Its absence, especially early, is not infrequent, and should not be allowed to outweigh the positive findings. (*A. J. Med. Sci.*, June, 1904.)

We clip the following from an American Consular Report. It is quoted from a statement issued by the Bombay Laboratory :—

"It was when using the material prepared in September-October, 1902, that 19 cases of tetanus occurred in the village of Malkowal, in the Punjab. Some 120,000 other people had by that time been inoculated with the same material, and the reports submitted from the Punjab and the rest of the country testified to the harmlessness as well as the effective immunizing properties of that material. The mortality from plague amongst those inoculated was reduced to a fraction of what it was amongst the non-inoculated. It is known that a very minute quantity of contaminated matter is required to cause tetanus. A surgical instrument scrupulously clean—*i.e.*, containing no visible impurity of any kind—may cause the disease if not preliminarily sterilized. * * * The material used at Malkowal might have become contaminated either at the laboratory or elsewhere. The following facts were against the admission that the tetanus germs had got into the prophylactic fluid in Bombay :—

1. The cases of tetanus occurred in persons inoculated from a bottle belonging to brew 53 N., of September 19, 1902. This bottle formed one of five filled from the same brew flask No. 53, N. That the brew was not contaminated was proved by the persons who were inoculated, at other places, from the remaining four bottles, having had no tetanus.

2. A fluid in which tetanus germs have gained entrance and lived for some time gives out a foul odour, which is perceived at a distance by bystanders when the vessel is unstoppered. The inoculators had no instructions to test bottles by smelling, but many of them did so. On this occasion, at Malkowal, the bottle when opened for inoculation, six weeks after it had been prepared in the laboratory, was smelt, and no odor was found in it. A fortnight after the bottle was used it was again examined, and by that time a smell had developed in the remnants of the fluid. The microbe of tetanus was also found in it then, in symbiosis with a micrococcus.

3. In the course of the above large operations in the Punjab, tetanus also occurred elsewhere than in Malkowal, but investigation showed clearly that the cause could not be imputed to the laboratory, and it was not so imputed.

The Malkowal occurrence did not, fortunately, diminish the indents made on the laboratory for prophylactic fluid from provinces outside the Punjab. During the nine months of the present working year, 1903-4, *i.e.*, the year following the Malkowal occurrence, the indents on the laboratory from places outside the Punjab amounted to 150,612 doses as against 107,652 doses during the same nine months of the year preceding that occurrence."

We direct attention to the very interesting letter from Lt.-Col. Giles, I.M.S. (*retd.*) in our correspondence columns.

Reviews.

A Manual of Practical Medical Electricity, Röntgen Rays, Finsen Light, Radium and its Radiations and High Frequency Currents. By Dawson Turner, B.A., M.D., F.R.C.P. (Edin.), M.R.C.P. (Lond.). Fourth Edition. Pages XXIII and 435. Illustrations 200. 10/6 *net*. London : Baillière, Tindall and Cox.

That this work supplies a long-felt want is evidenced by the short period in which four editions have been called for. In the present edition the author has paid more attention to the use of sinusoidal currents in treatment, and to the employment of the multiplate static machine in Röntgen-ray work. A new section on the radiations of radium and their mode of application has been added. The physics, physiological effects and therapeutic uses of high-frequency currents have been collected together and dealt with in a separate chapter, many other changes have been made, the whole book has been thoroughly revised and brought-up-to date.

We are in entire agreement with the author's hope that, the foundation of the electro-therapeutic society and the increasing interest that the medical profession is taking in medical electricity may stem the tide of unqualified electrical practice and put a stop to the intrusion of laymen into the practice of medicine. It is time, as the author with justice remarks, that practitioners should awake to the fact that it is both derogatory to themselves and injurious alike to their profession and to their patients to call in instrument-makers for radiography and nurses and masseurs for electro-therapeutic treatment.

The work is exceedingly well arranged, the subject-matter being concise, accurate, and to the point. It is well-printed on good paper, and its two hundred illustrations most excellently well-done, enhancing the value of the book in no small degree. The publishers have succeeded in producing the work in a way that leaves nothing further to be desired.

It is divided into six parts.

Part I deals with electro-physics, giving a concise account of the essentials of the different forms of currents, batteries and accessories.

Part II is devoted to electro-physiology in which we have a short résumé of the physiological effects of electricity in its different forms.

Part III composed of four chapters, deals with electro-diagnosis with details regarding the electrical resistance of the tissues and the electrical capacity of the human body. There is also an account of qualitative changes found in disease; the Re-action of Degeneration and its varieties.

Part IV discusses the application of electricity to different surgical affections. The views and results obtained by different observers are detailed.

In Part V we have a fairly elaborate account of electro-therapeutics which should be of the greatest value to the physician in the treatment of the various forms of neurosis and nervous affections.

The last section (Part VI) gives a valuable description of the nature and mode of application of Röntgen X-rays, Finsen Light and Radium Radiations, with an account of the treatment of disease by these methods and the results obtained. In the last chapter high-frequency currents and their therapeutic application are discussed.

This volume contains a vast amount of information written and arranged in a thoroughly readable manner. It is the most complete and satisfactory manual on medical electricity with which we are acquainted. We recommend this practical book to all those who are prepared to give a fair trial to new methods of combating disease.

Medical Monograph Series No. 10, Cleft Palate and Harelip. By Edmund Owen, M.B., F.R.C.S. Pages 111. Illustrations 41. Crown 8vo. 2/6 *net*. London: Baillière, Tindall and Cox.

This book does not pretend to treat exhaustively of the various operations which have been at one time or another practised for the relief of these deformities, but gives the result of the author's experience.

Chapter I deals with the development of the palate and lip.

Chapters II, III and IV with the material; the assistants and the treatment of the case preparatory to operation; they are short and to the point. The advice given on the feeding of the child before operation is well worthy of attention; the practice of feeding children on one of the many much advertised "artificial foods" is inveighed against.

Chapters V and VI are the most interesting and important, and discuss the advantages of the earlier operation on the palate; and the author's dictum is that "the most favourable time for operating on the palate is between the age of two weeks and three months."

Brophy of Chicago affirms that at this early age there is less shock from operation as the nervous system is less developed, and Mr. Owen's experience has shown him that shock at this age is less to be dreaded than he had previously imagined; he has in fact decidedly adopted Brophy's operation of thrusting the maxillary and palate bones together in the middle line, and, although he recognises the increased severity of the operation, he is of opinion that the advantages of being able to suture the soft parts together without tension and without interfering with the palatine attachments of the tensor and levator palate outweigh the increased risk. Certainly the case, he publishes in support of this view, shows a most excellent result.

The ordinary operation for the palate is well described; the author's operation for the lip is alone given. The book is well written, eminently practical, and is of value in making Brophy's work more widely known.

Questions and Answers on Midwifery for Midwives with Syllabus of Lectures for the L. O. S. delivered at the Fulham Midwifery School. By A. B. Calder, M.B., M.R.C.S. Pages XVI, 143. Pocket size. Price 1/6 *net*. London: Baillière, Tindall and Cox, 1904.

This little work consists of three parts, the first being a Syllabus of lectures as delivered by the author to his classes of midwives at the Fulham Training School. This doubtless would be found most useful by the pupils of that school taken in conjunction with their notes of the lectures, but we do not think it will be of so much utility to others, except perhaps affording assistance to those called upon to train midwives. The second portion consists of actual questions set at the L. O. S. examination, classified under their proper heading, *e.g.*, thus on Anatomy, Pregnancy, Nurses' duties, and so on, followed by model answers to each question. These answers on the whole are good and complete, but in some instances they appear to be somewhat too sketchy, and at times not very clearly expressed, and, to certain statements exception may be taken, *e.g.*—"If no vaginal examination were made there would be no puerperal fever." This, though certainly as a rule true, is not always so, as undoubtedly septic processes do occur at times in cases in which no vaginal examination has been made, the exhaustion carried by a tedious and prolonged labour being a most potent predisposing cause. On the whole, however, the teaching is decidedly reliable and practical, and this section should prove most helpful to pupils going in for examination in midwifery, not only in the matter of the information therein contained, but also in showing them *how* to answer questions; a factor of no small importance in contributing to success or failure of any candidate. The third portion, consists of papers set at the L. O. S. Examination from January 1897 to February 1904. This is followed by an Appendix containing a good deal of information concerning the recent Midwives Act.

On the whole, the book is one which can be confidently recommended as a help to those preparing for an examination to qualify as midwives, and it will also be well worth perusal by those engaged in teaching pupils for these examinations.

ANNUAL REPORTS.

DISPENSARIES, &c., OF CENTRAL INDIA AGENCY (1902).

THE report on the working of the dispensaries, jail hospitals and of vaccination in the Central India Agency for 1902, was written and submitted by the administrative Medical Officer Lieutenant-Colonel P. A. Weir, M.B., L.M.S., in good time, *viz.*, 30th May 1903 but the report apparently did not issue from the press till 24h September 1903, and only reached us in the end of April 1904. Such delay, on the part of those responsible for the printing and distribution of reports naturally largely affects the interest of such documents, and is satisfactory to no one concerned. The Central India Agency comprises Indore, Gwalior, Baghelkhand, Bhopal, Bhopawar and Bundelkhand.

There are 118 public dispensaries in the Central India Agency, and considerably over a million patients were treated, or 132 per mille of the population compared with 120 of the previous year. This is a satisfactory rise. Statement III shows that no less than 48,071 operations were performed, an increase over the figure of previous year of 5,715. Among these we find 471 cataract operations, 96 stone cases, 2 Cæsarean sections, 5 Porros', 5 ovariotomies, 1 hysterectomy and 3 laparotomies.

There is a useful Leper Asylum at Sehore with about 60 patients residing in it. The cost per leper *per diem* for upkeep was two annas eight pies.

Statement IX and X deal with the Jail Statistics of the Agency. There appear to be 35 "Jails" of sorts in the Agency, but only seven of these are of importance, *viz.*, those of Indore, Nowgong, Rewah, Nagode, Lashkar (Central), Ujjain, and Bhopal. The death and sick-rates vary in a most remarkable manner. Indore Jail (with accommodation for 411 and a daily average strength of 297, and a maximum population well under the registered accommodation) has a sick rate of 24 per mille of average strength, and the admirably low death-rate of 13·4. Nowgong Jail is a small place with accommodation for only 98 prisoners. It is remarkable that with a daily average strength of only 62 prisoners 26 of these should be always in hospital yet in spite of this enormous sick-rate, 421, per mille, the death-rate is *nil*. This is a point worth inquiring into. Rewah Jail, on the other hand, with a daily average population of 257, has only an average of 5 sick daily (rate only 21 per mille), yet the death-rate reaches the very high figure of 69 per mille. These are remarkable contrasts which seem to demand and probably are capable of explanation, and at first sight seem to point to differences in methods of treating the sick and weakly gangs. Nagode is a small jail (106) with a still smaller daily average population (33), the daily average sick numbered under two, and there were no deaths. Nor are the figures of the Central Jail at Laskar any the less remarkable. In this jail there is a registered accommodation for 1,000 prisoners, the daily average strength 953, the maximum number but 1,001, however there were no less than 13,486 admissions to hospital, the daily average sick list was 95, there were 62 deaths, or the very high death-rate of 65 per mille, while the ratio per thousand of admissions to hospital reached the extraordinary figure of 14,259. That much of this extraordinary sickness was due to the unhealthy condition of the new admissions to jail is clear when we read of seven deaths out of a daily average of only 60 under-trial prisoners or the appalling rate of 234 per mille. The Ujjain-Bhairogarh Jail has accommodation fixed at 525, the daily average strength was only 455, the daily average sick was no less than 70, the number of deaths no less than 43 or 94 per mille, an extremely high rate. The admission rate per mille to hospital was no less than 6,794, the daily average sick rate per mille was 155. In this case we cannot explain these high sick and death-rates by the state of health of under-trial prisoners, as no statistics for under-trials are given and apparently they are not kept in this jail. The Bhopal Jail is a big one, 1,100 accommodation, 819 a daily average strength, no overcrowding, the daily average number of sick was but 25, but the number of deaths was no less than 96, or the very high rate of 117 per mille. These figures are by no means satisfactory, and are deserving of explanation. In Statement IX we find the diseases of patients treated in the jail hospitals. Taking the three big jails only, *viz.*, the Central Jail at Lashkar, the Ujjain and Bhopal, Jails. Firstly, Laskhar Central Jail, here we find only 134 cases of dysentery and 309 diarrhœa, with 13 deaths, but 2,573 cases of "malarial fever" were treated, and under that vague and unsatisfactory heading "anæmia and debility" there were no less than 1,086 cases treated, and no less than 2,902 cases were registered as dyspepsia, the lung and respiratory diseases amounted to over 2,600 cases. In the Ujjain Jail there were 124 cases of dysentery and 124 cases of diarrhœa with 6 deaths, here also we find 881 case of ulcers. In Bhopal Jail there were only 53 cases of dysentery, and 201 of diarrhœa, but no less than 45 deaths are recorded from these two diseases. There was no cholera in any of the jails in the Central India Agency nor is there any mention of plague. There is nothing in this report to show the causes of the deaths in these jails beyond those for 'fever' and bowel-complaints. Of the 62 deaths in Lashkar 13 only were recorded as due to bowel-complaints, of the 43 deaths in Ujjan only 6 were due to bowel-complaints, and in Bhopal of 96 deaths 45 are recorded as due to bowel-complaints. It would be valuable to know under what headings the other deaths were returned and how many were under the heading "Anæmia and Debility"—a heading we would gladly see abolished from Indian statistical returns.

Plague in 1902 but slightly affected the Central India Agency, there being but 515 recorded cases, and 409 deaths in the Agency.

Current Literature.

SURGERY.

Surgical Observations in the Philippines.—J. E. Banister (*Journal of the American Medical Association*, April 30th) discusses a year's surgical work in the First Reserve Hospital at Manila; 428 operations were performed, of which 145 were considered capital. The total mortality was twelve; one of these deaths was due to tetanus; by a bacteriological examination everything connected with the technic was found to be aseptic, but true cultures of the bacillus were obtained from the scrapings of the floor of the operating room, although this was tiled and had been habitually subjected to scrubbing with a strong solution of carbolic. The probable source of infection was ascribed to dust blown in from the street about forty yards in front of the hospital; no mention is made as to whether the operating theatre was on the ground floor or higher up, this obviously is a factor of importance. Preventive measures were afterwards introduced consisting of either the windows being closed or covered with wet sheets and the floor scrubbed with strong carbolic just before an operation; slippers for use by the operator and his assistants were also provided.

Before going to the Philippines, Banister had heard that, on account of the climate, etc., wounds would suppurate freely, but he states that "with proper aseptic and operative technic, just as good results may be expected to follow operative work here as in any country under the sun," this is only what is to be expected. He adds that the greater prevalence of tetanus spores in the soil is an additional danger, but as regards suppuration his results show as good as if the operations had been performed in a more temperate climate.

There were thirty operations for appendicitis, all of which were in white men, and there was no record of this disease having been observed in the native. He operates without delay if there is no amelioration of local and general symptoms within a few hours.

There were only six cases of hepatic abscess; a history of amœbic dysentery was the rule; five were operated on by the abdominal route and one by the thoracic; two deaths occurred with multiple abscesses. He comments upon the fact that two were in natives, and notes that a paper in one of the American Journals stated that this disease was unknown among the natives of the Philippines Islands.

He records one recovery after laparotomy for bullet wound of the descending colon.

His conclusions are that aseptic results follow aseptic methods as surely as they do in other countries; if infection occurs blame the technic, not the

climate; the danger of mortality after an operation is not increased by the climate unless the patient is, at the same time the victim of some other serious disease.

The Treatment of Prostatic Hypertrophy.—(*Boston Medical and Surgical Journal*, April 28th) The following papers were read at a meeting of the Suffolk (U. S. A.) District Medical Society. Crandon describes the surgical anatomy:—He found that out of twenty cases the distance between the depths of the rectovesical pouch and the central point of the perineum varied between 5 and 9 cm., and that it increased when the bladder was full. In perineal prostatectomy the lacerations may be found from ½ to 2 cm. from the peritoneum and virulent infection of this pouch without macroscopic injury had been demonstrated in two fatal cases, which had come to his knowledge.

A. L. Chute discusses the pathology and mechanism of prostatic obstruction. Mere general enlargement as felt per rectum need not necessarily produce symptoms; on the other hand, obstruction and retention may occur with a relatively small prostate. The obstruction is as a rule at the bladder outlet, but changes in the shape and distensibility of the prostatic urethra are undoubtedly contributory. He recognises the clinical types, *i. e.*, the small hard fibrous prostate with the outward appearance of being of inflammatory origin. and second, the enlarged soft, often irregular or lobulated type.

In the fibrous prostate the obstruction in a few cases appears to be due purely to the infiltration about the vesical end of the prostatic urethra and the decreased distensibility of it, which destroys its normal funnel-shaped entrance. If this condition progresses, the resistance becomes greater than the bladder can overcome even with its compensatory hypertrophy, so that residual urine occurs and the formation of a small bas-fond The outlet now becomes not the lowest part of the bladder, and repeated attempts to empty itself leads to atrophy and fibrous infiltration of its walls. The overflow of distension or complete retention due to some circulatory change may be the first real sign that something is radically wrong.

In the second variety the enlargement may be a hyperplasia, though in the greater number of instances it is a benign neoplasm. The enlargement may be general or limited to one lobe. The enlargement is mainly upwards, but also towards the rectum; the urethral opening is carried upwards and in time this leads to residual urine and the establishment of a vicious circle. The symmetrical growth of the lateral lobes may extend forward as well as backwards, producing a projection into the bladder like an os uteri with the posterior tip the larger. In another arrangement both lateral lobes extend into the bladder, and an offshoot from one lobe lodges up under the trigone. The irregular forms of prostatic growth are found in the majority of cases of obstruction; they are usually adenomata and produce obstruction in direct ratio to their proximity to the bladder neck. Glands which have a similar structure to prostatic tissue have been found in the mucous membrane of the trigone and outlet of the bladder. It is supposed that certain sessile and pedunculated growths take their origin from this tissue Other foci of glandular tissue, supposed to be aberrant bits of the prostate, have been found *under* the mucous membrane in the region of the bladder outlet, and are considered to be the cause of some cases of third lobe obstruction or of a posterior lip or Mercier's bar.

An important element in prostatic obstruction is the occurrence of enlarged tortuous veins about the bladder outlet; they increase the pain and frequency of micturition, are a common cause of hæmorrhage, may become thrombosed They are supposed to play an important part in the causation of nocturnal frequency. Their engorgement is usually the determining factor in sudden retentions coming on after fatigue and exposure.

Some recent work of Wallace on the question of whether in hypertrophy of the prostate, this organ develops a distinct capsule, is of great interest. He finds that adenomatous growths are often surrounded by a laminated layer of tissue which allows of their easy enucleation. He demonstrates that this is not a thickening of the true fibrous capsules of the prostate, but that it is formed from prostatic tissue surrounding the growth, which has been compressed with the increase of the growth. This capsule varies in thickness and is densest where the pressure is greatest; glandular elements believed to be remains of compressed prostatic tissue have been found in this capsule. This capsule is of the greatest surgical importance, upon it depends the feasibility of enucleation; the probability of being able to spare the prostatic urethra and the possibility of a recurrence after enucleation.

Watson takes up the choice of operation and analyses 2,000 cases, the mortality of total perinæal prostatectomy and Bottini's operation is about the same and the lowest of all the operative measures; palliative operations alone have a high mortality.

The limitations of the Bottini operation are given as follows:—

(1) inability to obtain a good cystoscopic view of the bladder beforehand;
(2) a contracted thick walled bladder;
(3) a large middle lobe extending far up into the bladder;
(4) inability to enter the bladder with the instrument.

There is only one obstacle in the perinæal operation, *i. e.*, No. 3 above.

The supra-pubic operation is difficult with a contracted thick walled bladder or one adherent to the symphysis pubis.

In the Bottini there are the following objectional features:—

(1) insufficient drainage of the bladder;
(2) liability to secondary hæmorrhage;
(3) liability to orchitis and epididymitis;
(4) the necessity of repeating the operation in a considerable number of cases.

There is greater risk of injuring the membranous urethra and rectum in the perinæal operations.

He recommends the crescentic incision going from one ischial tuberosity to the other with an additional cut forwards in the centre of the perinæum, if necessary and finds, in most cases that supra-pubic pressure or a finger in the rectum are sufficient to bring the gland to the surface; with metal tractors at the moment of separation of the deeper intravesical portions of the growth, the greatest traction is necessary, and it is at this time that it is most dangerous to apply it, for then the resistance which has been opposed to the tractor blade by the hypertrophied lobe when still fixed to its surrounding structures is taken away, and there is a risk of the bladder or the urethral coverings of the lobe being torn through. He concludes that in the majority of cases the perinæal operation is the operation of choice. Balch discusses the use of the cystoscope in determining what operation is advisable; from this instrument one can see whether there is a thickened ring about the internal meatus or a thick posterior lip which conditions are favourable for a Bottini operation. Again, a pedunculated middle lobe may be present and so on. The cystoscope is of most value when the galvanocautery is going to be used.

Lund describes a case of perinæal prostatectomy which he performed while the patient was under special anæsthesia, the results were very satisfactory; the patient being able to assist the operator by voluntary movements and the entire absence of vomiting and the consciousness of the patient rendering the immediate after-treatment extremely easy; his condition too was also very good.

E. C. T.

Correspondence.

THE WIRE-GAUZE PROTECTION OF DWELLINGS.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I am sorry to find you ranging your powerful support against a method which has, practically speaking, been never tried in India, the more as I am sure that from the nature of the argument you employ, you can have no experience of the use of metallic gauze in the concrete, and therefore *assume* that it will keep out the breeze. Good metallic gauze, however, is a very different material from our time-honoured "chicks," and I know from actual experiment in India that if there be any perceptible breeze outside, it will make its way through the gauze so freely, that you will find it makes very little difference which side of it you place any appliance for measuring the force of the current.

As a matter of fact, on the contrary, one of the greatest advantages of the "meat safe" plan, is the facility it gives for the admission of every breath of wind under all circumstances.

As far as I remember, it is not altogether safe in Calcutta to leave every door and window wide open all night; and I have painful memories of the effective obstruction of the breeze by the closed jalousie doors which, with the slits even opened to their widest, reduce the available space of the door opening by at least two-thirds, where as with wire gauze the reduction is only about one-sixth to one-tenth according to the gauze of wire used and the heaviness or lightness of the frames.

You do not, I suppose, condemn the use of mosquito-nets which offer two or three times the amount of obstruction to breeze as compared with metallic gauze. Why then say anything that may tend to prevent people from *trying* the plan by the use of the rather stale jest about the meat safe? or better still why not try it in your own sleeping room and make a few experiments with a pair of anemometers, one placed against the gauze and the other in an opening cut through it.

It does not appear to me that if I desired to prevent folks from trying the alternative plan of mosquito destruction, I should be adding any very valuable argument to the controversy by calling the plan the "catch 'em alive fakement."

Whatever be the case, however, in Calcutta, "up-country" our houses, I am sorry to say, are almost all one storeyed; and it is impossible to leave the house open at night on account of the risk of having one's property stolen. Now a wire-gauze screen is a far more effective obstacle to burglars than the ordinary thin glass windows, which fill the upper half of an ordinary Indian door, and, quite apart from the question of malaria, it is well worth while to adopt the plan in order to be able to enjoy the inestimable comfort of taking advantage of every breath of wind. Thieves or no thieves, and to find one's house nicely cooled down in the morning if one has slept in the open, instead of finding it like the newly-opened oven it has become under the usual plan, when one is awakened from one's sleep in the compound by the noise, so familiar to all of us, of the servants opening the doors of the house in the early morning.

Anyhow *experto crede*. An ounce of experiment is worth reams of discussion, for I am sure that any one who tries the plan will at once find that all these purely theoretical objections about meat safes, will be found to be absolutely baseless when submitted to the test of the "common sense" course of trying a plan before condemning it.

Wire-gauze is, of course, in use in many of the better constructed houses in India as a substitute for "chicks," and all those who have inhabited houses so fitted, have, I have noticed, considered their gauze-fitted doors as the greatest of luxuries, because they allow every breath of air to pass and, if you come to think of it, that is the very reason why a meat safe is built on the same principle.

As a rule, however, the wire used in the manufacture of the gauze, and the frames over which it is stretched, are needlessly heavy for windows, and such doors as are not reserved for traffic, there is no need of frames at all as the material should be simply tacked on to the woodwork of the doorway, the edges being covered by thin battens.

The question of the disposal of night-soil is too large to be discussed in a few words, but I may say that apart from the puddle-producing tendencies of trenching grounds, I have personally, like many other people, long held a strong suspicion that the official and orthodox system of superficial trenching is one of the main of the prevalence of typhoid in cantonments.

I may be right or wrong, for I do not think that the question can be settled by a few laboratory experiments on flies, but it seems to me to give rise to most of the disadvantages of the native plan of indiscriminate fouling of the surface without the enormous advantage of free exposure to the bactericidal rays of the sun incidental to the method of the primitive man.

In writing that you have seen what deep burial of night-soil means, you probably refer to deep *trenching*.

If properly carried out, I doubt if even this be as pernicious as the orthodox plan—but that method referred to was not deep trenching, but deep, very deep, pitting. Pits of the sort I mean are, practically speaking, small *kachha* septic tanks, as some five or six feet of clean earth intervene between the offensive material and the air and practically seal the pit. The plan is a native one in use, very much against official grain, in many small towns in the United Provinces; and of course every Deputy Sanitary Commissioner is officially expected to condemn the plan without troubling himself to enquire whether the system be really objectionable or not. I noticed, however, that where the plan was obstinately persisted in, the grounds used were far less objectionable than such places usually are.

It was the custom to let the stuff remain in the pits from six to twelve months, and then to exhume and sell the material as manure.

By chance I once visited a town when they were digging out the manure. Whether it had undergone "nitrification" or not, I will not pretend to say, but, very much to my surprise, I found that the night-soil had become an almost dry whitish brown mass, quite free from all offence, and personally being open to conviction, have ever since declined to pronounce the curses on the plan with which Government expects an orthodox official to fill the two square inches allotted to the subject in the official inspection report form.

Yours, etc.,
G. M. GILES, *Lt.-Col.*,
I.M.S. (Retired).

[We propose to refer to the subject again.—ED., *I. M. G.*]

"ANTI-MALARIAL SANITATION IN INDIA."

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—In the article on the above subject in your August issue, which is a résumé of Lieutenant-Colonel Giles' account of his cold weather tour in India, the following passage occurs:—

"He scores a point where he shows that 'alike in our civil and military hospitals, no attempt whatever is made to separate malaria patients from those suffering from other diseases.'" During the last year I have held three appointments, first at Midnapore as Superintendent of the Central Prison there. In the hospital of that jail the malarial patients were not only treated in a separate ward whenever possible, but were all provided with mosquito curtains. Next I was sent to Lucknow as Superintendent of the Jails there, and in both jail hospitals malarial patients are treated in separate cells as carefully as those suffering from dysentery. Finally, I officiated for a short time as Civil Surgeon of Sultanpore, and it was a routine practice there to isolate such malarial cases as required indoor treatment.

The separation principle had been in vogue at Midnapore I know for at least a year before I went there, at Lucknow for some time, and at Sultanpore for at least six months, if not longer.

In the light of the above facts I think you will agree with me that the statement quoted is sweeping and unfair to many medical officers in India who do their utmost to keep abreast with the latest improvements in scientific methods.

LUCKNOW,
August 24th, 1904.

I am, etc.,
C. M. GOODBODY.

PERMANGANATE IN SNAKE POISON.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—In sending you an extract from *Nature* of the 19th June 1904 (page 141) for ready reference and insertion, if you think necessary, in the next issue of the *Indian Medical Gazette*, I wish to point out that recognition is also due to the late Deputy Inspector-General of Hospitals, John Shortt, M.D., of the Madras service, who spent a good deal of his time, for years, in seeking for an antidote for cobra poison. *Nature* states that permanganate of potash as an antidote to snake-poison was first used by Fayrer in 1869. I remember that Dr. Shortt, in 1868, illustrated among other experiments the action of permanganate of potash on cobra poison. He injected a fowl with cobra venom, and a few minutes after injected a solution of permanganate—the fowl died. He next *mixed* cobra venom with permanganate and injected part of this solution into a fowl, with the result that the bird lived. He explained then that the circulation of the snake poison was so quick that the permanganate following even in a few minutes was

not quick enough to neutralize, but when *mixed* with the venom it rendered it harmless.

Permanganate, he said, was an antidote to cobra poison, but the means of getting it into the circulation quick enough was yet to be discovered. Evidently the gifted members of the profession named in *Nature* have made that discovery.

The claims of the late Dr. Shortt, who was an old and esteemed officer of the I. M. S., to some credit in this discovery must, I think, be admitted, and I beg to ask for it through the columns of the Indian Medical Service Journal.

Yours, &c.,
G. T. CARROL, Capt., I.S.M.D.,
Civil Surgeon, Basti.

[The paper referred to was published *in extenso* in our September issue.—Ed., *I. M. G.*]

THE TREATMENT OF OPIUM-POISONING WITH POTASSIUM PERMANGANATE.

To the Editor of "The Indian Medical Gazette."

Sir,—This treatment has not found by any means strong support, although founded on good chemical reason, *i.e.*, that potassium permanganate decomposes morphia. If is naturally only useful to render harmless the morphia which is in the alimentary canal and so unabsorbed. No one who understands what poisoning is, would expect this drug to be of service when a case is seen late, and a lethal dose has already entered the blood stream. For poisoning is the result of a chemical union of the toxic body with molecules of living protoplasm or of fluids of the body and when this action has taken place, treatment can only combat adverse symptoms, due to upset of function performed by the altered molecules. To expect that such an oxidizing agent as potassium permanganate will be absorbed as such from the alimentary canal or subcutaneous tissue is futile, as it is to hope for it to decompose morphia in the blood stream or kick it out from a chemical union with tissue protoplasm.

A recent case, treated with this drug, clearly shows that good will result, provided the patient be seen early and before a lethal dose has been absorbed. Death resulted because such an absorption had already occurred.

The following is the analysis result:—

(1) The presence of morphia in quantity was detected in the urine, but no meconic acid.

(2) The presence of morphia in quantity and a mere trace of meconic acid was detected in a mixture of pieces of liver, spleen and kidney.

(3) The presence of meconic acid in quantity, but no morphia was detected in the stomach washings (washing out was performed at once, when the patient was seen, first with warm water, and then with solution of potassium permanganate).

(4) Both morphia and meconic acid were detected in the stomach contents (removed after death), but the amount of morphia was very small and did not nearly correspond to the quantity of meconic acid. The urine analysis, I consider, shews that a large quantity of poison had been absorbed, while the entire absence of morphia in the washings and mere trace in the stomach contents, indicates that treatment would have prevented further absorption.

What the action of the drug upon the other active principles of opium is, I have not been able to find, but I intend, if this investigation has not been done, to take it in hand.

J. N. WINDSOR,
Capt., I.M.S.,
M.B., M.R.C.S., B.A., B.Sc.,
Officiating Chemical Analyst to Government, U. P.

Service Notes.

THE MEDICAL DEPARTMENT OF THE JAPANESE ARMY.

(Compiled by
The Second Division of the General Staff,
United States Army.)*

Officers of the Army Medical Service are recruited principally from students of the medical school or the University, who are required subsequently to undergo a course of instruction at the military medical school.

One year volunteers, who are licensed to practice medicine or to dispense, and men between the ages of 20 and 30 who have matriculated at the military medical school, may be appointed surgeon probationers and promoted to 3rd class surgeons.

Medical officers are classed as non-combatants, but have a relative military rank, the highest grade being that of lieutenant-general. The hierarchy of the apothecaries extends only up to the relative rank of major.

The uniform is of dark blue cloth with green facings, the capbands are green, the braid stripes green, and the lace stripes silver.

In peace time the headquarters medical *personnel* of each division consists of one principal surgeon, two surgeons, and nine medical subordinates. At the headquarters of each division is a well equipped garrison hospital, and local hospital, and local hospital arrangements are made at out-stations, each hospital being provided with a suitable proportion of medical officers, apothecaries, and medical subordinates.

The Red Cross Society has a central association in Tokio, with a branch in every ken (prefecture). It is a very flourishing institution, its lists of subscribers containing nearly 700,000 names.

There are hospitals in all the chief cities, that in Tokio being a specially fine one, and there is a large staff of trained nurses, male and female, who in time of peace are at the service of the general public.

The Society possesses two large steamers, the "Mercy" (Hakuai), and the "Saviour" (Kosai), specially constructed and equipped as floating hospitals, which did excellent work during the operations in China, 1900-1901. In these ships the wounded and the sick find all the comforts furnished by a first-class hospital on shore, and are under the charge of a large staff of highly-trained surgeons and nurses.

ORGANIZATION IN WAR.

In war time, to each mobilized division is attached a medical detachment, consisting of detachment staff, two sanitary (or bearer) companies, six field hospitals, with due proportion of riding and baggage horses.

In the Chinese campaign, 1900-01, the establishment was as follows:—

Field Hospital:
1 Chief medical officer.
5 medical officers.
1 apothecary.
9 N.-C. officers, medical corps.
40 privates, medical corps.
1 cutler.
5 privates (infantry soldiers).

Transport train:
1 senior driver.
1 N.-C. officer driver.
40 men.

The composition of the Bearer Company at Peking was as follows:—
9 medical officers.
1 apothecary officer.
1 pay officer.
14 N.-C. officers.
1 pay N.-C. officer.
26 trained men, hospital corps.

A company can nurse 100 sick, but a single company does not carry a complete set of stores, the organization for war being two companies, with a complete equipment for 200 sick.

Reserve Hospitals are established either in or out of military garrisons, for the reception of patients sent back from the field, as well as for those from regiments of the reserve and from the garrison.

The establishment of a reserve hospital comprises:—
1 surgeon-colonel, surgeon-lieutenant-colonel or surgeon-major, as chief.
2 or 3 medical officers.
1 to 4 pharmaceutists (officer).
1 commissariat officer.
3 to 5 chief attendants.
1 to 6 pharmaceutists (N.-C. officers).
2 to 8 commissariat N.-C. officers or men.
30 to 40 attendants.
1 to 2 mechanics.

(*a*). If a sufficient number of medical and pharmaceutical officers be not available, their places may be filled by temporary civil medical practitioners and pharmaceutists.

(*b*). Deficiencies in attendants and pharmaceutists are to be made up by the 1st or 2nd class reserve attendants (N.-C. officers), or by temporary hired employés.

(*c*). The duties of all, excepting those of hospital chief, commissariat officer, and under officer, may be taken by members of benevolent societies.

(*d*). For every increase of 40 patients over 120, 1 medical officer, 1 chief attendant, and 10 to 13 attendants may be added.

* From *Journal* Military Surgeons, U.S.A.—Ed.

(*e*). The chief of the hospital is subject to the commander of the territorial division.

Auxiliary Hospitals may be established when required.

Medical Service on Line of Communications.—The medical staff of the line of communications consists of :

1 surgeon-lieutenant-colonel or surgeon-major, as chief.
1 surgeon-captain or surgeon-lieutenant.
1 pharmaceutist (only where there is no reserve medical stores).
1 N.-C. officer.

Reserve, Medical Personnel.—To each division is attached medical *personnel*, organized at the time of mobilization, its duty being to serve in the stationary field hospitals.

Reserve medical *personnel* is named after the division to which it belongs. The establishment is as follows :—

1 surgeon-major as chief.
2 surgeon-captains.
4 surgeon-lieutenants, 1st or 2nd.
1 pharmaceutist (officer).
1 commissariat officer.
14 chief attendants (N.-C. officers).
40 attendants (N.-C. officers).
3 pharmaceutists (N.-C. officers).
9 servants.

The medical officers are, as far as possible, to be taken from the active list, and in case of deficiency in that, from the first or second class reserves.

Stationary Field Hospitals.—A stationary field hospital is intended to receive patients from the field hospital, the place of which it takes, so that the latter can advance.

It is not to move with the fighting line like a field hospital, but is to receive patients at a fixed place, continuing its work until there is an opportunity of sending them back.

The chief of a stationary field hospital is a surgeon-major or a surgeon-captain, and the strength of the *personnel* varies according to requirements.

Reserve Medical Store.—On mobilization, one reserve medical store is allotted to each division, and named after the division to which it belongs. The following is the establishment :—

1 chief store master (lieutenant of train).
2 train N.-C. officers.
6 train privates (2 shoeing smiths).
1 pharmaceutist (officer).
2 pharmaceutists (N.-C. officers).
2 mechanics.
1 clerk.
2 servants.

The reserve medical store is located in a place convenient for the despatch of supplies to hospitals, &c., as a rule at the most advanced stations, or where there is railway or water communication.

If one portion of the army becomes detached, a reserve medical store is attached to it.

Transport of Patients.—On mobilization, a staff to arrange for the transport of patients is organized in each division. It is named after the division to which it belongs, and comprises :

1 major or captain as chief.
2 medical officers (surgeon-captains or surgeon-lieutenants).
1 chief attendant (N.-C. officer).
2 attendants (N.-C. officers).
1 clerk (N.-C. officer).
3 orderlies.
3 servants.

As a rule, the transport staff is located at the most advanced station of the line of communications, or were there is either railway, ship, or other convenient means of transport, the existence of houses, etc., for the reception of patients being taken into consideration. On the advance of the fighting line the transport also advances.

Field Hospitals.—The function of the field hospital is to receive the wounded form the dressing stations, or directly from the fighting line and to transport them to the rear, gradually relieving the dressing stations, so as to enable the bearer company commander to advance or retire without hindrance.

Field hospitals are called by the names of their division, counting form No. 1 to No. 6 in each division. The *personnel* and equipment of each are so organized as to be divisible into two equal parts.

A field hospital should be as near as possible to the dressing station, easily seen, sheltered from the enemy's fire, and convenient for the transport of wounded.

Dressing Stations.—The dressing station is established near the fighting line, in such place as can be easily found by the soldiers, is out of the enemy's fire, convenient for the transport of the wounded, and when possible in the vicinity of good water, and in the hot weather in the shade.

Its function is to receive wounded men from the fighting line, and to permit of their being medically treated before transfer to the field hospital.

Hospital Ships and Transports.—These are used when suitable water communication is available.

Medical organization of the different Arms of the Service.—The establishment of Medical *personnel* with units is as follows :

Infantry Regiment :
2 surgeon-captains (one officer may be a surgeon-lieutenant-colonel or a surgeon-major).
4 surgeon-lieutenants,
3 chief attendants.
12 ordinary attendants.
48 reserve bearers (trained soldiers belonging to the regiment).

Cavalry Battalion :
1 surgeon-captain (or surgeon-major).
1 surgeon-lieutenant.
1 chief attendant.
1 ordinary attendant.

Battalion of Artillery :
1 surgeon-captain (or surgeon-major).
2 surgeon-lieutenants.
1 chief attendant.
2 ordinary attendants.

Battalion of Engineers :
1 surgeon-captain (or surgeon-major).
1 surgeon-lieutenant.
1 chief attendant.
2 ordinary attendants.

Battalion of Train :
1 surgeon-captain (or surgeon-major).
2 surgeon-lieutenants.
3 chief attendants.

War Establishment of a Mobilized Division.—The medical strength of the war establishment of a mobilized division is shown in the following table :

	Non-Combatants.				Animals.		
	Officers	N.-C. O.	Pvts.	Total	Pack, Riding.		Total
Medical sanitary detachment ..	13	60	330	403	40	10	50
6 field hospitals ..	42	54	606	696	300	42	342

Capt. W. H. Kenrick, I.M.S., was appointed Civil Surgeon of Hoshangabad, C. P.

Privilege leave for 2 months and 29 days was granted to Capt. A. M. Fleming, I.M.S., and Capt. G. Fowler acts as Civil Surgeon of Chanda, C. P.

Privilege leave was granted to Hony.-Capt. W. J. Montgomery, Civil Surgeon, Wun District, C. P.

The services of Lieut. W. D. Ritchie, M.B., I.M.S., are placed at the disposal of the Assam Government and is posted to Aijal.

Capt. E. C. Macleod, I.M.S., is transferred to Gauhati as Civil Surgeon, Kamrup, District.

Military Asst.-Surgeon R. A. Boermel, is transferred to the Garo Hills as Civil Surgeon.

Capt. T. H. Kelly, I.M.S., and Capt. Cook Young, I.M.S., were attacked at Lhassa by a Tibetan fanatic but fortunately escaped with but slight injuries.

Capt. Chatterton, F.R.C.S.I., Bengal, has got 3 m. extension of leave.

Vernacular translation of pamphlet entitled "Instructions for the restoration of the apparently drowned."—With a view to making Native soldiers acquainted with the methods of restoration to be employed in such cases, a pamphlet of instructions on the subject has been printed in Hindi, Urdu and Gurmukhi. Copies will be issued gratis to units on the scale of 15 per regiment of Cavalry, 5 per Native Mountain Battery, and 20 per battalion of Infantry.

Commanding Officers should submit indents direct to the Superintendent, Government Printing, India, Calcutta, stating the number of copies they require in each character. The number of copies indented for must not exceed the total above authorised.

Capt. E. J. O'Meara, I.M.S., was appointed Civil Surgeon of Mirzapore.

Civil Asst.-Surgeon J. Hormasji, L.R.C.P. & S. (Edin.), was appointed Civil Surgeon of Thongwa, Burma.

Major J. K. Close, I.M.S., was granted 6 weeks' privilege leave from 1st August.

Capt. T. Hunter, I.M.S., was granted 3 months' privilege leave.

Mr. P. J. Freyer (Lt.-Col., I.M.S., retired) of St. Peter's Hospital, London, has now published no less than 73 cases operated on by himself for enlargement of the prostate.

Major W. D. Sutherland, I.M.S., is appointed Civil Surgeon of Akola.

The Officers, R.A.M.C., at Rawal Pindi have started a series of fortnightly meetings for the discussion of medical and scientific subjects.

Lt.-Col. G. J. Kellie, I.M.S., was appointed *sub-protem.*, to be P.M.O., Dejarat District.

The privilege leave granted to Sir Benjamin Franklin, K.C.I.E., I.M.S., took effect from 15th August 1904.

The services of Capt. W. G. Richards, I.M.S., and of Lieut. D. G. Rai, I.M.S., are placed temporarily at the disposal of the Government of Madras.

Capt. Robertson-Milne, I.M.S., having come back to Bengal, is posted as Deputy Sanitary Commissioner with his head-quarters at Purulia.

Capt. A. C. Macgilchrist, I.M.S., is confirmed in his appointment as Surgeon Naturalist Marine Survey of India.

The recent articles in the *Lancet* or the Social and Economic position of Medical practice on the Continent is melancholy if interesting reading. Perhaps it should make us more content with the state of affairs in the services out here.

Major C. T. Hudson, I.M.S., Bombay, has been granted twelve months' combined leave.

The following revised list of subjects for examination of Captains, Royal Army Medical Corps, before promotion to Major, which has been approved by the Army Council, is published for information :—

1. Medicine, including specific fevers.
2. Surgery, including skiagraphy.
3. Hygiene.
4. Bacteriology and tropical diseases.
5. One special subject from the following list :—
   - Bacteriology.
   - Dental Surgery.
   - Dermatology, including Venereal Diseases.
   - Otology, including Laryngology and Rhinology.
   - Midwifery and Gynæcology.
   - Operative Surgery.
   - Opthalmology.
   - Psychological Medicine.
   - State Medicine.

2. The necessary amendments will be made in King's Regulations.

Pensions—Senior Assistant Surgeons, Indian Subordinate Medical Department.—In modification of the ruling contained in Article 1619, Army Regulations, India, Volume I, Part I, it has been decided that a senior Assistant Surgeon, while still remaining eligible for the rates of pension laid down therein on promotion to Captain, will receive an additional pension of £10 a year, or Rs. 10 a month, for each completed year of service after promotion to that rank, subject to a maximum of £200 a year, or Rs. 200 a month.

Lt.-Col. J. Lancaster, I.M.S., Madras, retired from the service on 5th July, 1904.

Lt.-Col. R. Pemberton, I.M.S., Madras, was recently appointed District Medical officer, Nilgiris.

Lt.-Col. S. C. Sarkies, I.M.S., was recently appointed District Medical officer, Bellary.

The leave of Surgeon-General D. Sinclair, C.S.I., I.M.S., will expire on 11th October 1904.

Lt.-Col. W. B. Browning, I.M.S., C.I.E., is due to return from leave on 31st October 1904.

A correspondent sent us the following extract from a Native paper on the recent fee regulating order :—

"Doctors Fees and Native Chiefs.—The *People* of Calcutta, writing on the recent Government order regulating fees to be taken from Native Chiefs, says :—When it comes to be insisted on that the medical man should give a detailed report of the nature of the case to the Political Agent or even to any third party, such a proceeding seems to us highly improper and altogether subversive of that confidence reposed in a medical attendant ; a confidence that it is the just pride of the fraternity to keep inviolate. The patient is the best judge of the value of the relief afforded, and we feel sure that not one member of the profession would seek to exact more than his patient could afford. But setting aside the fee question, the doctor is frequently consulted upon subjects that no patient would like to become public or official property. We presume that this order applies as much to the lady doctor as to her male compeer, in which case its objectionable character is intensified, for the maladies of ladies of the harem and zenana are frequently of such a nature that the patient would die sooner than have them formed the subject of reference beyond her own attendant. The order is an implied slur on the profession inasmuch as it hints, it is rapacious."

Lieutenant-Colonel W. H. Burke, M.B., I.M.S., is appointed Civil Surgeon of Poona, *vice* Lieutenant-Colonel Henderson, I.M.S.

Lieutenant-Colonel M. A. T. Collie, I.M.S., is appointed Surgeon to the G. T. N. General Hospital in addition to his own duties, until further orders.

Captain P. C. Gabbett, I.M.S., has been granted combined leave (*m.c.*) for 15 months.

Captain J. W. Cornwall, I.M.S., has been granted 15 months' combined leave from 1st August.

Notice.

Scientific Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will **receive 25 Reprints gratis**, if requested.

Communications on Editorial Matters, **Articles, Letters and Books for Review** should be addressed to The Editor, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to The Publishers, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscriptions to the Indian Medical Gazette, Rs.* 12, *including postage, in India. Rs.* 14, *including postage abroad.

BOOKS, REPORTS, &c., RECEIVED.

The Report of the Government Laboratories in the Philippine Islands.
Collis Barry's Legal Medicine, 2nd Ed. (Thacker & Co., Bombay.)
The Indian Homœopathic Reporter, Calcutta.
Indian Public Health, No. 2.
Capt. James' Causation and Prevention of Malaria.
Squire's Pocket Companion to B. P. (Churchill & Co.).
Punjab Asylum Report.
Assam Sanitary Report.
Rajputana Hospitals Report.
Assam Hospitals Report.
Punjab Sanitary Report.
Punjab Vaccination Report.
Assam Vaccination Report.
Burma Hospitals Report.
Bengal Police Report.
Madras Government Hospital Report.
Madras Sanitary Report.

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Original Articles.

INSANITY FOLLOWING THE USE OF INDIAN HEMP.

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Hemp Drug Insanity.

There is a special form of mental disease met with in India usually classed as Toxic Insanity which seems to have a direct relation to the excessive use of hemp drugs in any form. It has a definite train of symptoms of a fairly uniform character; there is in the large majority of those affected no hereditary history of insanity, nervous disease or tubercle; the sufferers are men of every age (I have never heard of a woman addicted to this habit); many, indeed most, are of good physique without any bodily peculiarity or abnormality,—one never sees for instance the decayed teeth which I personally regard as so very common among insanes; a history of moral exciting cause is usually wanting, and indeed the only invariable element is the history of this *habit*, and the cases usually present so much uniformity as to give a reasonable supposition that they show a definite effect following a definite cause. The symptoms are almost entirely mental, among the large number I have now seen, unlike the results of alcohol, arsenic, etc.; these hemp cases never show any affection of the optic nerve, multiple neuritis or other concomitants such as would enable one to place them in the same category with the cases of toxic insanity observed in Europe.

The Hemp Plants.

As to the habit in question.—Hemp is a plant cultivated largely throughout India and Central Asia. In the Punjab it may be seen growing wild anywhere at the commencement of the hot weather, and, as is well known, it is used in three chief forms: *Bhang*, *Ganja*, and *Charas*, though there are numerous other synonyms and designations for different forms of intoxicants made from the same plant.

Ganja consists of the plant itself, stem leaves and flowers matted together in long bundles; in other words, it is the dried flowering top of the cultivated female plant which has become coated with resin in consequence of having been unable to set seeds freely.

Bhang in a mixture of the leaves and capsules without stems, while *charas* is the resinous excudation from the leaves and flowers, the method of manufacture of which is so primitive as to be worthy of mention:—The cut female heads having been dried for 24 hours, each handful is rubbed between the palms—the product scraped off is *charas*—similar other methods for obtaining the adherent juice are in use, but each involves the same admixture of a large amount of human perspiration.

Ganja is the variety used for smoking in *chillums*, the native substitute for a pipe, and is then usually mixed with tobacco; its retail price is said to be 20 rupees a seer; but this, I imagine, must be an error.

Bhang is made into a decoction and drank often mixed in various ways. It is the cheapest form, and I am told is to be purchased at 3 to 4 annas a seer.

Charas is the most concentrated form and is either smoked or swallowed whole: its price is said to be from 40 rupees a seer; but, as a matter of fact, it is always purchased by the consumers in minute quantities,—a few pice worth at a time.

Thandai, *Siddhi Sabzi* and *Patti* are local names for various mixcures, generally decoctions, though this does not by any means exhaust the list of beverages in use all containing hemp as the basis.

The much spoken of *Haschisch* is the Arabian preparation of hemp and is analogous to *charas*. Like all the others it is the product of the dried flowering tops of the female plant, the Cannabis Sativa, Cannabinaceæ, the active principal of which, according to Lauder Brunton, is a resinoid substance cannabin, the tops also containing a small amount of volatile oil. A certain amount of *Bhang* is used by the general population as a "cooling drink" in summer, and being then taken in weak solution is quite harmless, but the invariable effect of these drugs in any excess or for long continued period is a most pernicious one, as is clearly seen in those men who resort to it as a form of dissipation, and take one or other in gradually increasing doses. It is this *habit* which is rightly considered among natives as so disgraceful, and which produces the evil effects so generally attributed to this plant.

The ordinary Sikh will of course have nothing to do with either *ganja* or *charas*, both of which involve the use of a "*chillum*," though the last named drug, on the contrary, is very largely consumed by "*Faqirs*;" and many of the sufferers met with here ascribe the origin of their habit to association with these men, notwithstanding which curiously enough it would be difficult to find any general reprobation among the native population for either of these classes, though perhaps correctly they regard the remainder of the consumers as standing on a different footing; these latter being weak, dissipated men who have taken up the habit from idleness and viciousness, and who are rightly looked upon by all as belonging to one of the two classes of the weak or the vicious.

The Supposed Attractions of the Drug.

As regards the attraction and inducement to this form of indulgence I have been at

considerable pains to enquire from all capable of an explanation as to the habit, and, by comparing the statements, have obtained a description which though rather vague is so uniform as to leave little doubt that it represents the general native opinion.

In the first place it is universally believed that this habit has a great advantage over that of opium or alcohol or even tobacco taking in that it may be at any time relinquished without difficulty, and though I do not know whether this is absolutely true, I can certainly testify that no ill-effects follow its sudden forcible stoppage against the will of the patient. There is, however, equally little doubt that any form of the drug produces a violent craving for it, that the amount taken is gradually increased, and that apart from the physical effect a general moral deterioration, as in alcoholism, sooner or latter sets in, so that, as is well known, an habitual *charas* eater will spend his last pice on the drug in preference to buying himself or his family food or clothing. In the Sikh Temples *bhang* is taken much after the fashion of "punch" in times gone by, *i.e.*, from a common bowl, by many men in company, and one often sees at any festival a large iron vessel full of it exposed for public consumption. It is, I believe, rare to find a solitary drinker either of that or indeed of any of the hemp drugs, even those men who stated to me that they brought their own supply always added that they took it in company, and it is a notorious fact that there are certain "seats" (takiars)* in large towns, such as Lahore, where these very men congregate for this purpose, and though men, such as prisoners, under special conditions take *charas* in the form of pills when alone, all natives assert that this drug is, in the Punjab, usually smoked in a *chillum* with tobacco and then generally in company, very rarely alone, the *chillum* being handed round from one to the other, or as they say, one man smokes it until he becomes dazed and then passes it on to another. Their motive, they assert, is to get *aram* to make their food digest (and that for this reason it is usually smoked before a meal), to produce a sense of general well-being, etc., etc.; curiously enough all the smokers are mixed and not necessarily of one caste; when questioned as to quantities they state that "one pice worth can produce *nasha* (intoxication), but that there is a gradual habituation as usual to the drug, and the amount taken has to be slowly increased. Some state that one pice worth of *charas* will suffice for 4 or 5 men, so that it is difficult to ascertain the exact quantity taken, and the probability is that the amount varies with the habituation and as to the relative amount of tobacco if mixed with it and taken in that manner, and the market price, etc.

Although the fact seems so extremely unlikely, it is universally stated that while *bhang ganja*, etc., are aphrodisiacs, some add that *charas* has a contrary action, and that it is used for this purpose by *Fuqirs*, a qualifying statement, however, which throws great doubt on its probability. Many natives have assured me that this desire along with its intoxicating property is the real reason for the use of all these drugs, though all agree that *Fuqirs* take *charas* ostensibly for the opposite purpose.

A very clear account of the habit was given me by one patient, whose statement is a good example of that furnished by all. This man had no heredity of insanity, nervous disease, or tubercle, and all enquiries failed to elicit any probable cause for his insanity. He was admitted originally on 13th October 1901, for acute mania presumably due to hemp drugs, and discharged cured on 11th April 1902. He obtained work in Lahore as a brass worker, and for a time remained sane and did well. Some family trouble of a trivial nature occurred, and he again resorted to these intoxicants, and a fresh attack of violent mania quickly followed for which he was readmitted; his insanity then had the usual characteristics of garrulity, constant laughing and talking, general incoherence, continual restlessness and reckless violence with sleepless nights and the typical flushed face and congested conjunctiva. He was filthily dirty, indescribably so, he had a huge sloughing wound on the ankle from which he several times a day tore the dressings and filled the sore with fæces. However, he rapidly recovered (in about a month) and remained sane for nearly a year until finally discharged in that condition. Though, like all these men, he had absolutely no recollection of his insanity, after recovery he voluntarily described his hemp habit and attributed it to that; this man used to take half a tola of *bhang* mixed with *khur* and sweetmeats (ostensibly to increase its intoxicating effect) and water as a *sherbet*. This cost him a pice at a time, 1½ pies for the *bhang*, and 1½ for the other ingredients, and the luxury would suffice for two or three men to become completely intoxicated on; half tola of *bhang* would make *one* man very intoxicated. The motive, according to him, was to get *aram* "to cast his thoughts on God," "to make him work better."

During the *nasha* or intoxication the men sleep or are in a state of ecstasy. This, however, is followed next day by headache, for which they apply "*dhai*" to the scalp as a remedy.

He agreed that *bhang* and *charas* could be relinquished at any time, though he added that others denied it and was very clear on the subject of *bhang*, "like opium," being an aphrodisiac. Since his discharge the man has not reverted to his habit and coincidentally has remained sane, and I have seen him quite recently (1st April 1904).

* Literally a cushion or *Faqir's* wooden seat.

Cannabis Indica as a cause of Mania a well founded Belief.

Although it is an undoubted fact that Hemp Drugs are only used by a small, a very small, proportion of the inhabitants of India, there is a widespread belief, which as far as I can gather has always been held, both among the general population and also among European medical men practising among them, that an excess in the use of these intoxicants in any of these varieties is the cause of an enormous proportion of the cases of insanity occurring in the country, and my experience during the last four years as Superintendent of this Asylum has convinced me that in any case for the Punjab this belief, if we restrict it to the causation of mania, is extremely well founded.

This, however, seems to be contrary * to the conclusion of the Commission of 1894, appointed to enquire into the use of Hemp Drugs in India, when an enormous mass of information was collected on the subject and embodied in a report in which the various inferences deducible were discussed in a most thorough and able manner. No one who has read through the volumes of the Report in question can have failed to have been struck with the ability of the observers, and the obvious sincerity of the conclusions they drew from the evidence brought before them, though at the same time the smallest practical experience of insanity among natives of India, is sufficient to convince one that these conclusions in this particular were mistaken and that excessive indulgence in any form of hemp drugs is a very frequent cause of mania, at least in the Punjab. (I am not competent to speak of other provinces.) The fact is an important one, and the belief that any practical experience in the matter is worth publishing must be my excuse for the present paper.

In the first place the number of cases is remarkable, in which the insanity is attributed, on the schedule of particulars received on admission, by the relatives who come to see the patients or by the patients themselves after recovery, to the use of those drugs, and though no one would venture to say that the opinion volunteered is not likely to be in error, there can be little mistake as to the fact of the habit; one often verified by the statements of friends and relations and confessed to by the man himself after recovery.

No one also will dispute, that the possibility of the fact that an insane may have been a *charas* eater, and yet that his insanity may have arisen in other ways or that the habit may be a secondary cause in one otherwise predisposed by heredity, etc., to mental disease, indeed the very characteristic of the habit lends probability to the assumption of this being often so, for it is seen very frequently in men of vicious dissipated habits and leads frequently to destitution, misery and many other troubles sufficient in a predisposed man to start insanity. It is also possible that, as in the case of alcohol, *charas* excess may be the first symptom of loss of control in whom madness is commencing, but, when all this is said and allowed for, the history of many cases is so extremely clear and apparently conclusive, cases where all heredity of insanity or other allied disease or other possible alternative factor seems certainly non-existent, and the association of the habit and the disease is so extremely frequent that no unprejudiced observer could avoid being convinced of its strong influence in causation, while in regard to the possibility of false statements, it need only be remembered that the habit is regarded as very disgraceful and is not one that would be willingly admitted (indeed it is often studiously concealed), so that such an explanation is in the highest degree improbable. It might also be asked when this excess is so frequently given as the cause of mania among males as to why this habit is never assigned either in the schedule or by the relatives or by the patients in cases of melancholia, primary dementia, epilepsy, or any form of insanity among females—*it never is.*

Comparatively Slight Prevalence of the Hemp Habit.

Now it must be remembered that only a small proportion of the population are addicted to the use of these drugs and only some of these to excess. The Commission of 1894 went very carefully into this matter, and by a most ingenious method arrived at a conclusion which agrees with common observation and was in all probability correct, and that was that only some 0·5 per cent. of the population, or more probably a quarter of the number, are in any way addicted to the habit.

On the other hand, nearly 33 per cent. of the male patients in the asylum are believed to have been habitually hemp drug takers at one time or another, a relative difference which if nothing more is at least extremely striking. Lest this statement should be capable of misconstruction, I should like to say that it cannot, of course, be supposed that the cases of insanity treated here, the only asylum in the Punjab, represents the entire amount of mental disease in this Province, of nearly *24 millions* of people. A far greater number of helpless harmless cases must be at large and untreated. The numbers seen here only represent the total of those so troublesome and so dangerous as to be of necessity put into seclusion. It is, however, precisely these noisy, troublesome

* The mental effects "moderate use produces no injurious effects except in specially marked neurotic diathesis." "Excessive use indicates and intensifies mental instability." "Moderate use produces no moral injury whatever."
Commission on Hemp Drugs Report 1894, Vol. I, p. 263. In opposition to this, though I do not say either that every even moderate user of hemp will become insane or that mental disease in a *charas* or *bhang* consumer is *necessarily* due to this, I am strongly of the opinion that *any excess in their use is extremely likely to be followed by an attack of mania.*

dangerous cases that are most often attributed to hemp excess, and proof is continually accumulating that this belief is often well founded, still as it is impossible to speak with any degree of accuracy of the patients at large I can only give a few statistics and base my conclusions on those who have come under my notice here, though neither can I give any evidence of a contrary nature, that is to say, that I am not aware of any men addicted to excess of *charas* who have remained sane. The common native opinion is that such always become mentally affected, but this I have not as yet been able to test; certainly a large dose of hemp invariably causes definite symptoms to be subsequently described, and the probability to my own mind is that the common opinion is correct. Since this asylum opened (on the 1st March 1900), 819 men and 191 women have been under treatment, and in 161 of these men excess in use of hemp drugs was alleged to be the cause of their insanity; most of these cases in which I believe the supposition true are detailed in the appendix. As no woman has ever been* declared a victim to the habit, we may exclude the females. In 452 of the cases remaining, these were wandering lunatics unable, or refusing, to speak, of whom nothing was known, and in whom therefore no cause for their insanity could be suggested—only two among the cases attributed to hemp showed symptoms of melancholia, and in these the correctness of the suspicion was very doubtful. Excluding all these, we may therefore say that of 543 cases of mania seen in males under treatment from 18th March 1900 to the end of 1903 in this asylum, in those for whom any cause was suggested, in no less than 161 was this attributed to hemp drugs. This is a proportion which very careful enquiry from individual cases has led me to strongly believe (with the exception of the two doubtful cases specially noted) to be little, if at all, exaggerated.

A few words of explanation are perhaps necessary in regard to the remark that many of the cases are so attributed on the schedule sent in with the patient; it is doubtless well known that, with every patient sent in, a "schedule" of particulars is required by law to accompany them. As these patients are generally finally brought under notice by complaint of neighbours or sufferers from the annoyances they cause (and only rarely by friends and relatives) to the police on the ground of the trouble they give, it almost always results that the onus of providing the information required falls on these officials who are supposed to obtain it from, I believe, the *chowkidars* of the village in which the patient resided. This method, primitive as it sounds, is theoretically excellent as this functionary is on the spot and has every opportunity of finding out all the details of the history needed, especially in a country like this, where people so rarely change their residence. Unfortunately there is little doubt that even this small amount of trouble is not taken. The "schedule of particulars" bears too often every evidence of being filled in *most perfunctorily and imperfectly*, a fact much to be regretted, as owing to the long distances from which many patients come, it is frequently months before friends visit them, and at the outset of their stay here corroborative evidence is often wanting. However, by taking advantage of such visits when they do occur, by questioning the patient on his recovery, and by enquiries and other means, a considerable number of these statements can be verified and tested, a practice which here is now always followed.

The Uniformity of Symptoms Predicates a Uniform Cause.

Curiously enough the cases of insanity attributed to hemp drugs excess show always a wonderful and most striking uniformity of symptoms, both mental and physical, and were the causation given frequently, put down in error or at random, it is inconceivable that other cases of mental disease totally differing should not have been frequently included.

I have also notes of several cases in which men discharged completely cured (who had owned to the habit and attributed their insanity to it) have shortly after leaving again indulged in it to excess, and have quickly became insane while *vice versâ* others who have strictly abstained have remained sane. Of several of these men showing these contrary instances I have most intimate knowledge, and the sequence has been too exact to leave at least, in my opinion, any ground for doubt on the subject, and though I would not venture to assert that in others the men may not have had already a predisposition to the disease even allowing this, the excess in hemp drugs has certainly seemed to have been the exciting agent.

I have repeatedly met with instances in which after recovery a man has attributed his insanity to a single large dose of *bhang* or *charas* generally stated to have been administered by a *faqir*. In those in which there has been no family history of insanity or nervous disease and no exciting cause to which the attack could have been reasonably attributed, the accounts given have been so exact and circumstantial, and the symptoms are all so similar, that I am strongly of the opinion that a *mania transitoria* will occasionally follow one prolonged excess. The history always given is that they have been induced to partake of a large amount, that they fell into a state of *nasha* (intoxication) and remember nothing more until finding themselves in custody or in the asylum. It is difficult to state the duration of the lapse of

* In one woman the cause was stated to have been hemp excess, but this could not be substantiated.

memory, it is certainly several days and may sometimes extend to some weeks. Such cases exhibit the usual symptoms, so characteristic of acute mania attributed to hemp drugs; *i.e.*, violent mania of sudden onset with great exaltation and sense of well-being, restlessness, noiseness, a tendency to commit wilful damage, and especially acts of reckless violence, with physically a suffused face, bloodshot eyes, heat of scalp, etc.; the duration of such attacks is usually short as the patients almost invariably recover rapidly under treatment. The immediate effects of any very large dose of hemp is, first, dizziness followed by excitement, delirium, hallucination of a pleasant nature, a rapid flow of ideas, a state of ecstasy, a great inclination to muscular movement, with a marked tendency to acts of wilful damage and violence, a state of recklessness and disregard for danger and consequences, the whole followed later by deep sleep and forgetfulness of all but the initial symptoms.

It is well known that *bhang* was often taken, especially by Sikhs, to nerve themselves for acts, such as fighting, requiring dash and courage, and it is notorious equally that people intoxicated with hemp drugs are liable to commit acts of homicidal violence, to run *amock*, or to attack people without provocation. It is certain that acts of this kind, quite unpremeditated, may be performed practically unconsciously under the influence of *charas*, etc., and no recollection may remain on recovery. On the other hand, this property of the drug may be taken advantage of by a man to nerve himself for a deed which he has already planned,—murder, etc.

Though these facts are undoubted, though curiously enough the use of Cannabis Indica has been advocated in England as a valuable sedative and hypnotic in insanity. On account of its diuretic effects, when given with bromide it forms a most valuable and successful combination and one largely used both in epilepsy and in cases of chronic mania, especially when these are characterised by hostile, vindictive and homicidal violence.* Reynolds used also to advocate its employment in the sleeplessness of senile insomnia and as a general hypnotic. Even in England, however, its use is contra-indicated in the stage of acute mania and that of melancholia and depression, and personally I should hesitate long before administering it in this country where such a large percentage of the patients have been previously addicted to it, even when the medicinal doses given are so extremely minute compared to those which the habitues have been in the habit of taking. It is, however, extremely difficult to form an accurate comparison between the medicinal doses and those taken as an intoxicant, or rather it is difficult to believe the result even though the statements are extremely unanimous. The best comparison is perhaps to be made with the medicinal extract and *bhang* (*i.e.*, the mixture of the leaves and capsules without the stems); of this four men will take 2 ounces [*bhang* is sold at 4 annas a seer (=32 ounces), 4 men will smoke one pice worth $=\frac{1}{16}$th or 2 ounces, and this one would imagine equal 0·4 ounces of the extract for four men which would amount to 0·1 or 43·7 grains each]—an incredible amount.

The Fatal Effects of sudden Large Doses.

Natives of this country occasionally assert that sudden death may follow a "prolonged pull" at a chillum of *charas* or *ganja*, and though this, I imagine, is more than doubtful in healthy men, an enormous dose of hemp may of course prove fatal. In 1898 I saw two such cases of this nature: in each the man, a prisoner, had been previously addicted to *charas*, but had had perforce to relinquish the practice on confinement. Each however suddenly obtained possession of a considerable amount and took a larger dose than ever he had done on the last occasion before having been arrested. The effect was rapid coma with vomiting of green coloured contents of the stomach, stertorous breathing, etc., with most marked congestion of the conjunctivæ and coldness of the body surface. *Post-mortem*, there was a most curious congestion of all the internal organs of the body forming such a strongly marked appearance as to greatly impress an observer. Now it is well known that Cannabis Indica has medicinally a powerful diuretic effect, one which probably explains its value as a combination with Bromide of Potassium — also it is noteworthy that as I have remarked in scores of patients, all cases of toxic insanity from Hemp

* Bevan Lewis, *Text-book of Mental Diseases*, p. 483. He, however, also states that in full doses it causes great exhilaration and a condition of reverie with a pleasurable train of mental and nervous phenomena, vivid hallucination, and a stage of ecstasy followed later by sleep. In this particular Wood also, who apparently experimented on himself, is frequently cited as to these symptoms being followed by numbness, spells of partial unconsciousness to surroundings, an indefinite prolongation of time, seconds seeming hours; an exaggeration of a distance and a horrible sense of impending death, with an antagonism between the feelings and the will "referred to an outside factor inimical to the personality." He also notes the powerful diuretic effect of the drug and alludes to the benefit of its combination with Bromide for the purpose of avoiding Bromism—*en passant* it may be said that in medicinal preparations one of the greatest drawbacks to its use is the extreme variation of strength found in different preparations. Similar effects of hemp intoxication though varying in detail are cited by Gribble and Hehir, p. 451, and Chevers, p. 219—as having been given by Baudelaire (this latter author I have been unable to study in the original, nor have I been able to find the works of O'Shaughnessy who is also quoted in the Hemp Drugs Commission, 1894 Report, p. 198, Vol. 1.) As comparing the first intoxication of an adult with hemp to cases of delirium tremens, and as remarking on the strange balancing gait of the patient, the constant rubbing of his hands together, the perpetual giggling, the propensity to chafe and caress the feet of bystanders of any rank, and as stating [which is undoubtedly true] that the eyes have a distinctive expression of cunning and merriment and that other patients may be violent or highly aphrodisiacal, and a few voraciously hungry, most observers state that the urine in the case of those taking Cannabis Indica in addition to being increased is said to have a peculiar odour as of a Tonquin Bean and generally add that its use leaves no bad effects on digestion—this latter is a point on which opinion among natives differ, but all are agreed that on awakening from sleep they suffer from extremely prolonged and violent headaches.

drugs* have marked conjunctival congestion especially seen in the horizontal vessels, in recent cases these showing acute congestion and in old ones even of many years' standing this being replaced by a well marked line of blood pigment in the same situation. This is almost always met with and is peculiar to such cases.

There is indeed little doubt that one of the effects of hemp is to act directly in the sympathetic portion of the autonomous nervous systems (*Brain*, 1903, page 1) and to affect chiefly the blood-vessels, and that its continued use causes prolonged dilatation of vessels, and probably their stasis in all the smaller capillaries of all the internal organs and the explanation of the common belief among natives of the country that the use of hemp predisposes to Dysentery and Diarrhœa lies, I believe, in the chronic congestion of these organs.† Whether an explanation of a similar nature is applicable to its effect on the brain, I am unable to say, but that it has such an action there is not the smallest doubt. Its effects may vary with the amount taken and the habituation of the taker from the condition of mild "*nasha*" to a state of pleasant, semi-delirious, rapid flow of ideas, pleasing often sexual, hallucinations, a condition of ecstasy and indifference to surroundings, or rather an interpretation of these to anything most pleasant, passing on to wild delirium, struggling recklessness, and acts of violence, acts of which on awaking not the slightest recollection remains. From a condition of this kind indulged in every day the unfortunate man, either increasing his allowance or repeating it so quickly as to leave no perceptible time for recovery from each intoxication, passes into a condition of mania. In this state he usually enters the asylum either in acute mania or (if the indulgence has been less in degree but more prolonged) in a condition that can be only called chronic mania. This last indeed being perhaps the most frequent as many of the acute cases rapidly recover on abstinence. These indeed, the very acute forms, only vary in degree from the pure *mania transitoria* already mentioned, just as this is only a variation in degree from the condition of reckless violence met with in acute intoxication.

This is perhaps the place to recall that almost all writers on the effect of Cannabes Indica, and especially of that form known as "Hashish," lay great stress on one very curious effect that it has in producing an enormous apparent prolongation of time and exaggeration of distance; during the full intoxication seconds seem hours, "a strange sensation of all seen objects being at a great distance," objects seem as though looked at through the wrong end of a telescope, etc., etc. The descriptions are very uniform and undoubtedly correct, though I have never been able to obtain any accurate description of the same from the dull, uneducated people who form the large majority of those coming under my notice.

The Diagnosis of Hemp Drug Insanity.

From a diagnostic point of view I should say that a case of prolonged mania in this country with intervals of great excitement and great exaltation of ideas, a tendency to impulsive acts of violence and destruction in the earlier stages, with total loss of memory for the same and for most of the commencement of the disease and attended with the peculiar conjunctival congestion alluded to is extremely likely to be of toxic origin from hemp drugs, and a subsequent complete recovery renders it all the more likely, while at the same time the acute cases are, I consider, almost unmistakable.*

Treatment.—For treatment the most essential point is the absolute stoppage of all hemp drugs, while residence in an asylum, regular feeding, fresh air, exercise, and some regular manual employment are very beneficial.

I have never yet found any drug of the slightest service whatever, and that after extended trial of very many, and I am quite sure that the employment of blisters to the nape of the neck, leeches to the temples, nauseating doses of tartar emetic and saline purgatives, formerly recommended, are nowadays as useless as unnecessary.

In the very few cases that I have been able to examine *post-mortem* I have never been successful in finding any changes sufficiently marked or uniform as to warrant their being described, and almost always there is to the naked eye apparently nothing abnormal. In regard to the possibility of being called in to a case of acute poisoning, in the later stages after the excitement the characteristic look, mania, has passed off, and partial or complete insensibility has set in, it will

* I must own to having met this peculiar condition in two women (women never use hemp drugs), one was a case of mania with delusions occurring in a case of a woman who was an inveterate tobacco smoker, though she denied the use of any other drug, and the other was a case of chronic mania in a woman without history available, and who was so incoherent that it has been hitherto impossible to learn anything from her, as to her previous habits.

† There is a current belief among natives that the use of hemp inclines the taker to dysentery and diarrhœa, while others, though admitting the association, explain it by the consequent privation and defective food usually *endured* by such people. It is difficult to obtain a medical opinion on the matter, as, owing to the small number in reality of natives who take these drugs, it is extraordinary the number of medical men (in general practice) of long standing in India who have no experience of hemp consumers and necessarily of any connection between the use of these intoxicants and disease.

* The history and symptoms of the use of hemp drugs are, as is well known alluded to in most works on Forensic Medicine, though in none are they so admirably described as in that wonderful work of Dr. Chevers (3rd edition, 1870, p. 219.—Ed., *I. M. G.*), where will be found a most interesting summary. He alse alludes to a symptom which I have never met with, namely, a complete loss of speech lasting for prolonged periods after recovery from the intoxication, the patient understanding what is said and making "vain attempts to speak." In these cases there seems to have been a form of isolated paralysis of the tongue. Many of the old records of cases of poisoning by Hemp are, however, it must always be remembered, instances in which the drug was given mixed with *dhatura*, and it is not always easy to separate the action of the two.

be found that there is intense coldness of the body surface, a weak pulse, slow, laboured breathing, and frequently purple lips and pupils contracted (Chevers). For such the only treatment is complete and speedy evacuation of the stomach, and use of stimulants as antidote, vinegar, citrics, acetic, and tartaric acids have been recommended, while it is worth remembering that coffee, tea, and cocoa are said to increase the action of the poison.

Summary of Cases.

I append a short summary of those cases which have come under my notice since the beginning of 1900 to the end of 1903 in which there seems reason to believe the use of hemp drugs to have been productive of the insanity. A large number of others in which this was also *stated* to have been the cause I have omitted, as the facts alleged could not be sufficiently substantiated. Those given number 95, and the summary will perhaps give a better idea of the characteristics common to them than any description. For excluding the cases of melancholia, which are somewhat doubtful, it will be seen that the remainder present a fairly uniform character of form of acute and chronic mania, generally accompanied by delusions marked loss of memory for some part of the illness, by general incoherence, noiseness, restlessness, and especially by the tendency to impulsive acts of violence, usually utterly forgotten on the recovery, that is so much more common among these cases than in those of a similar character arising otherwise.

Of the 95 cases, looked on as being of this nature, which have come under my notice only six have become demented, and though six died 43 recovered, while the remaining are still under observation. In 30 of the cases there were marked delusions, and in 74 great incoherence of speech, and exaltation of ideas as a marked feature; many of them indeed being so incoherent as to render it impossible to understand them, and in some of these delusions might thus have escaped notice.

Many of the cases it may be urged are simply examples of intense intoxication and of a nature not requiring admission to an asylum, but it will be seen that *there is every gradation between these and prolonged acute mania,* and no one with any practical experience of the furious homicidal and destructive tendencies of these patients will question the advisability of their being at once put under restraint and observation and proper treatment.

Of the cases summarised it may be added that unless where stated to the contrary enquiry had failed to elicit any heredity of insanity, epilepsy or other nervous disease, and that the patients themselves were not epileptic and had never received any head injury or been exposed to any obvious exciting cause for their attack of insanity.

No 1. *Nur Shah, admitted 6th August,* 1891, *æt.* 46.—Then supposed to have been insane 16 years, undoubted history of *charas, bhang,* and *opium,* his father also having been addicted to the habit. He killed a man with a *lathi* and has frequently violently attacked people Has delusions that he killed a man who is still alive. Has no memory, no idea of time, in later stages delusions of grandeur and great possessions. Exceedingly talkative and incoherent, sometimes talks sensibly, at other times to the air, always unreasonable. Later developed asthma—mental symptoms had never borne any relation to severity or occurrence of disease. Not epileptic, deformed or paralysed. Died of heart failure, 26th November, 1902.

No. 2. *Bsawan syce, admitted 26th October,* 1891, *æt.* 30.—Admitted with delusions that Government owed him vast sums of money, wild incoherence of speech. Mistakes in time, says he has been in asylum 3,500 years, that Kabul is five steps away, and a history of a habit of sitting on the road, abusing passers-by, combined with occasional exaltations of excitement, and moroseness up to present time Is noisy, quarrelsome, abusive, has exalted ideas of his own position, frequently nude. Cause stated to have been excess in *charas.* No family history obtainable. No deformity or paralysis.

No. 3. *Mana Singh. admitted 16th February,* 1892, *æt.* 32.—Formerly a Naick in the 39th B. I. Clear history of *bhang* drinking. (See Hemp Drugs Commsn., appendix, page 13) Discharged from service for mental unsoundness, attempted a murderous assault on a Sessions Judge with a *gandassa*—2nd admission. First attack 1869, no heredity. Not an epileptic. Doubtful history of a head injury. Morose, obstinate, given to dressing fantastically, writes letters to the Czar of Russia, "all Sikhs," etc. Delusions that a spirit within him does this. Never incoherent, hallucinations of voices. In same condition at present time.

No. 4. *Kanaya, admitted 17th January,* 1893, *æt.* 40.—Killed a man without provocation or apparent object, incoherent speech, fits of excitability, delusions of *devatas* coming to eat with him and that a man long dead comes each night. Gradually became demented[1] liable to fits of excitability and noisy chattering. History of use of *ganja* and *charas.*

No. 5. *Mahamad Baksh, admitted 20th May,* 1894, *æt.* 32.—History of use of *bhang,* admitted in state of mania. Noisy, singing, shouting, tearing clothes, filthy habits, incoherence and restlessness. He continued in this condition and died ultimately of pulmonary phthisis of a few months' duration, 9th April, 1900.

No. 6. *Ramzan, admitted 6th April,* 1894, *æt.* 45.—A Mahomedan, lately converted to Christianity, a habit of tobacco, *charas, ganga,* and liquor-drinking. Delusions of grandeur, thinks himself a king, etc, very abusive and violent, often most murderously inclined, quarrelsome, liable to fits of excitement, always talkative, noisy, and quarrelsome, later auditory hallucinations, became incoherent, still in asylum, 19th May, 1903.

No. 7. *Said, admitted 9th August,* 1895, *æt.* 55.—This man was a mendicant with no family history of insanity. A letter No. 2071 of 19th September, 1895, from the Deputy Commissioner, Peshawar, states that the patient was in the habit of employing the coins obtained in charity, on *bhang* and *charas,* frequently going without food to obtain these drugs. He was originally violent, chasing people, pelting them with stones, abusive, had once fired a house, talkative, etc., later on he became morose, obstinate and silent, but even then ate and slept well. He has now gradually become demented, and is still in the asylum.

No. 8. *Peroo, admitted 9th August,* 1895, *æt.* 23.—Family history unknown, but he is stated to have been in the habit of using hemp drugs Originally very incoherent, talkative, with delusions of enemies who wish to beat him, and as to his forefathers. Developed dirty habits, with defective memory, became demented. Still in the asylum.

No. 9. Jaffar Shah, admitted 3rd October, 1895, *æt.* 35 —Has been in the habit of using *charas* and opium for the last 9 years, very violent and intractable, incoherent and filthy, attempted to set fire to places. As a result of his habits he became reduced in circumstances. On admission he was violently talkative, with delusions of having been robbed of money and jewels, but later became more melancholic, but still extremely talkative, and full of delusions as to his enormous loss, later incoherent, abusive, and dirty; delusions of females coming around him, always chattering. Died of exhaustion, after chronic dysentery, 8th July, 1891.

No. 10. *Harri Chand, admitted 22th August*, 1895, *æt.* 38.—Family history known. No insanity or nervous disease. Confessed to having been in the habit of using hemp drugs to excess. States that he daily took himself one pice worth of *charas*, continues constantly asking for *charas*. Delusions of a religious nature, was formerly a *Sadhu*, very irritable, always fighting, very violent and abusive, subject to periodical attacks of excitement, delusions of his brother having robbed him. Still in the same condition and in the asylum.

No. 11. *Santa Singh, admitted 16th July*, 1896, *æt.* 33.—Speaks perfectly sensibly and voluntarily gives a clear account of having become temporarily "*behosh*," as a result of hemp drugs; and in that condition having injured his wife with an axe. Was in the habit of drinking heavily, a bottle of spirits daily and 2 oz. of *bhang* (?) in company with others. He is a Sikh, a disciple of Guru Gobind Singh, certified as being morose and melancholic, refusing to reply, and indifferent to food before admission. Since has been sane. Still under observation as a criminal lunatic, 31st December, 1895.

No 12. *Pala Sing, admitted 28th July*, 1896, *æt.* 22.—Murdered his wife in a fit of mania from *bhang*. Occasionally excited and irritable, rapidly became stupid and dull, with loss of memory. Habits of masturbation—still in asylum, 19th May, 1903.

No 13. *Nazar, admitted 11th March*, 1897, *æt* 28.—This man had been for a long time addicted to the use of *charas* and suddenly one day attempted to stab a Sheikh who was preaching against the use of drugs. A fairly quiet and reasonable man, but subject to attacks of extreme violence, with delusions of personality. Later became silent, naked, destructive, and dirty. Unable to speak coherently, or to apparently understand what is said to him Died of septicæmia, after erysipelas, 27th March, 1901. Was originally a Mahomedan *fakir*, never suffered from epilepsy. Family history unknown.

No 14 *(doubtful), Amir, admitted 10th August*, 1899, *æt.* 22.—This man's mother was an epileptic for 14 years. He himself has never had epilepsy. His mother is now insane, he killed his paramour in a fit of sudden anger, absconded for a month, later denies all knowledge or recollection of the crime, and declares himself unable to understand why he is imprisoned, though on first arrival he was filthy, destructive, and noisy. He has since become sane and remained so until the middle of 1903 when he again became insane. Delusions of religious duties, very angry and obstinate, always asking to be allowed to convert the King. Still in the asylum.

No. 15 *(doubtful), Tulsi, admitted* in 1897, *æt.* 32.—A Brahman, shopkeeper, no epilepsy or insanity in family—since observation has always been restless, incoherent noisy, rushes about shaking his hands and jabbering incoherently, masturbates, formerly had delusions of places; gradually became demented still in asylum.

No. 16. *Lala Viroo, admitted 29th December*, 1897.—Originally convicted for theft and sentenced to two years' rigorous imprisonment When admitted was dirty, noisy, quarrelsome, and abusive, also destructive, given to talking to the air, answering questions irrelevantly. In the asylum once killed another patient by rupturing his spleen, is now an excessive tobacco smoker. Was before admission addicted to *charas*, no epilepsy. Still in the asylum, now has good memory and control of volition and attention, but very quarrelsome and garrulous.

No. 17. *Sham Sing, admitted 12th March*, 1898. A mendicant Sikh, said to have been formerly arrested as a lunatic in Jhelum, no epilepsy in self or family. Cause excessive use of *bhang*, when admitted had filthy habits, eating excreta, etc., was sleepless and constantly chattering; delusions of grandeur, *e.g.*, that he had given India to the Europeans Was arrested on account of tearing up telegraph poles and wires while insane.

No. 18. *Ahmed, Din, admitted 4th October*, 1898, *æt.* 30.—Sentenced to five years' rigorous imprisonment for culpable homicide. No family history, owned to indulgence in hemp drugs. The man was occasionally melancholic, but at other times excitable and irritable, speech was silly and disconnected, dress fantastic. Handed over to friends on security.

No. 19 *Ganga Ram, admitted 2nd September*, 1898, *æt.* 30.—A syce, twice in the asylum, insanity said to have followed a love affair, but he was certainly addicted to *charas* and liquor. Continually repeating a woman's name, and was in the habit of pursuing females. Rapidly became very sensible, with good memory and speech, very obstinate disposition. Given to suddenly knocking his head against the wall. Still in the asylum. Family history unknown No delusions. Known locally as subject to fits of dangerous violence.

No. 20. *Harichand, admitted 16th October*, 1898—Formerly admitted in a state of acute mania, a *sadho* addicted to large quantities of *bhang* which he is even now asking for. Delusions of being an important paid servant of the asylum, very quarrelsome, perpetually talking incoherently. Still in the asylum.

No. 21. *Maluk, admitted 30th April*, 1899, *æt.* 55.—Killed his wife when under the influence of intoxicants, acquitted on the ground of insanity. States that for 2½ months of that time his memory is a blank. Completely recovered, later died sane, of dysentery, 18th June, 1900. Clear history of indulgenee, given by himself.

No. 22. *Santa, admitted 25th November*, 1898, *æt.* 34.—Owned to being addicted to *charas* and *bhang*, and that when in a state of *nasha* he killed his wife, smashed her head in but remembers nothing of it Was in the constant habit of taking one pice worth of *charas* daily, sometimes also *bhang* and spirits. Became sane enough to stand his trial 8th June, 1900, but having been acquitted on the grounds of insanity, was readmitted (31st December, 1900) as a criminal lunatic, Class 2nd). Is now in the asylum and becoming weak-minded.

No 23. *Bassawa Singh, admitted 25th October*, 1899, *t. unknown.*—A sepoy of the 6th B. I For past few years has freely indulged in Cannabis Indica (*charas*). No history of heredity. He is said to be a *thug;* when admitted foully abusive Distributing scraps of paper under delusion of these being telegrams from the G.O.C. and at other times currency notes. Very violent and destructive. Some loss of memory. Filthy habits. Discharged as sane. 5th July, 1900.

No. 24. *Anant Matkar, admitted 16th December*, 1899, *æt.* 27.—A. ward-orderly, 13th Bombay Infantry, attached No. 52 Field Hospital, Khyber force. Was accustomed to smoke large quantities of Indian hemp Once unyoked horses from a tonga and brought them into the fort under delusions they were his own. Very excited, laughing and weeping in turns, sleepless and restless. Attempted suicide by jumping off a high wall. Incoherent abusive and violent. Discharged sane, 6th June, 1900.

No. 25. *Zaman Shah, admitted* 21st *December*, 1899—A criminal lunatic sentenced to 1 year's rigorous imprisonment (353, I. P. C.). Delusions of being king of the Jogies, and possessor of six enormous rubies, each worth a king's ransom. Dresses in rags, and paper crowns, etc. Very excitable, talkative and restless, a great smoker Family history unknown. Owns to *charas* habit Still insane.

No. 26. *Pir Bakhsh, admitted 2nd January*, 1900, *æt.* 20.—Incoherent. Fits of extreme violence—is filthy and

abusive, loss of memory, a sodomite (passive agent). History of *bhang* drinking for short period. Delusions of great wealth. Discharged sane, 5th July, 1900.

No 27. *Sirkhi Shah, admitted* 14*th February*, 1900, *æt.* 40.—Criminal lunatic, a confirmed *charas* eater, and *bhang* drinker. Threw a boy of 5 down a well while under its influence. Owns to taking 2 or 3 pice worth of *charas* daily, and getting his neighbours to give him more whenever possible, a habit of 22 years. Formerly incoherent, restless, abusive, and quarrelsome, etc. Nearly blind, speech almost unintelligible. Became sane. Still in asylum

No. 28. *Pooran Shah, admitted* 2*nd June*, 1890, *æt.* 35. Insane 30th April, 1890 Cause, *bhang*, *charas* and poppy heads Not epileptic. Family history unknown. On admission, talkative, incoherent and filthy, sometimes abusive and violent Habits of stealing and violent excitement without cause. No memory not violent after 1898. Became melancholic later, still in the asylum.

No 29. *Bindra Bun, admitted* 18*th March*, 1891, *æt.* 23.—Duration then nine months, history of *bhang* drinking in excess. Delusions of beautiful woman appearing before him, sexual acts, etc Fits of great violence at times, twice committed assaults suffering from diabetes on admision, temporary. Memory unimpaired. Became weak-minded. Still in the asylum. Family history unobtainable Habits of grimacing and posturing.

No. 30. *Allah Ditta, admited* 21*st May*, 1900, *æt.* 19.—Admitted in a state of acute mania, very grotesque, restless, and noisy. Continually talking incoherently. No delusions or loss of memory. History, by others to whom he was well known, is that he was addicted to *charas*. Family history good. No insanity or epilepsy Discharged much improved

No. 31. *Nand Lall, admitted* 31*st May*, 1900, *æt.* 30.—Admitted continually craving for *charas*, states that he could and did consume one *tola* and several *mashas* daily. Enquiries made through Deputy Commissioner of the district revealed the fact that he had been addicted to *charas* for five or six years, and that no members of his family had ever been insane A case of acute melancholia No delusion or loss of memory; sane 1st October, 1900. Discharged 8th January, 1903

No 32 *Parmesar Singh, admitted* 16*th June*, 1900, *æt* 35.—Formerly a police constable in Lahore, known as a notorious consumer of *bhang*, this he also owns himself, but states that one of his brothers was an epileptic No family history from other sources obtainable. Delusions of being king of Delhi and of the Punjab. Speech, however, is also rambling and incoherent, very violent at times, memory defective. Still in the asylum, 19th May, 1903.

No. 33. *Sunder Singh, admitted* 24*th June*, 1900, *æt.* 20—Sent in as a case of mania, dirty noisy, destructive to clothing, went naked. Since arrival stupid, dull and heavy, memory at first good, very defective power of attention Became demented and a mud eater. Still in the asylum The father states that his insanity followed his habits of indulgence in *charas*.

No 34 *Palaji, admitted* 24*th June*, 1900, *æt.* 32—An insane criminal sentenced to transportation for life for murder, became suddenly insane while on the way to the Andamans. Addicted to spirits, opium, *bhang*, and *charas*, particularly the latter, undoubtedly obtained possession of *charas* while on the journey No history of violence or delusions Became morose and melancholic, followed after a short interval by foolish silly behaviour. Self satisfied, smiling, varying with fits of morose silence, during 1903, much improved, is now almost sane.

No 35 *Jan Mahamad, admitted* 27*th September*, 1900, *æt* 45.—A beggar admitted as a criminal lunatic having savagely assaulted without provocation three British soldiers at Peshawar. He has a history of excess in *charas*, etc No family history is forthcoming. His memory is very deficient, extremely incoherent at times. Delusions as to having had his land stolen from him. No power of attention. Now himself owns to *charas* habit, and repeats the same statment often. Still in the asylum, improved, quiet but weak-minded.

No. 36. *Bhagwan Das, admitted* 28*th January*, 1900, *æt.* 42—Admitted for the second time, on both occasions incoherent, noisy, and dirty with outbursts of violence alternating with melancholia. A shopkeeper, owns to having been in the habit of taking a pice worth of *bhang* daily for many years. There is also a history of having lost his whole savings, which were stolen by a younger brother and spent in debauchery. Still in the asylum in a state of chronic mania.

No 37. *Hira, admitted* 24*th December*, 1900, *æt.* 22.—History of insanity for three weeks following excess in *charas* and wine drinking. No family history obtainable. In a state of mania, noisy, destructive to clothing, etc, emotional, weak-minded No delusions or loss of memory. Recovery; was discharged sane, 12th June, 1901.

No 38. *Ghulam Mustafa, admitted* 19*th January*, 1901, *æt.* 70.—Acquitted of charge of murdering his servant, on grounds of insanity. Owned to excess in *charas* consuming (in the company of 10 to 12 men), 1 *chittak* of charas, emotional, talkative, excited, very uncertain temper. No delusions. Loss of memory doubtful. Died of heat apoplexy 13th June, 1901. No *post-mortem* possible.

No. 39. *Khan Singh, admitted* 19*th January*, 1901, *æt.* 25.—Was an attendant in a Sikh temple and in the constant habit of *bhang* with the other worshipers for ten years, also one *ratie* of opium at night. He himself attributes his insanity to *bhang* Loss of memory for a time Very querulous and emotional. No delusions, easily excited; still weak-minded. Criminal lunatic, attempted suicide.

No 40. *Kallu, admitted* 19*th January*, 1901, *æt.* 46.—A criminal lunatic having murdered a woman in the street without provocation with a piece of wood lying there. Owns to having been in the habit of taking *charas* 1 tola, and bhang 1 pice worth per day, or as much as he could get and as often as he could for years. Originally in a state of mania lasting six months. Has now been sane 20 years

No. 41. *Bhagwana, admitted* 19*th January*, 1901, *æt.* 23.—States that he took *bhang* frequently in excess, and one day after an excess of *charas* threw his sister's child from the roof of a house killing her. Mania remained, sane for some years, and then after, it is believed having obtained some *charas*, quite suddenly, within a few hours, became acutely maniacal, filthy, incoherent, naked, rapid talking, constant movement, no sleep, refusing food; remained so six months Now again sane. No members of family ever insane.

No. 42. *Abdul Kadir, admitted* 28*th February*, 1901, *æt.* 26. Was arrested breaking telegraph wires when insane (second attack). Bad memory, incoherence, dirty habits, passing excreta in clothes, destructive to clothing, delusions of a priest having made him mad. Duration of attack four weeks before admission, passed through a period of partial weak-mindedness, recovered sanity, discharged sane, 19th July, 1901, history of habit of smoking *charas* and *ganga*. No family history of insanity.

No. 43. *Mahamad Alli, admitted* 31*st March*, 1901, *æt.* 45.—Admitted in a state of acute mania, noisy, boisterous incoherent, naked, refusing food, Rapid improvement followed a few days later, and he was discharged sane, 12th June, 1901. The cause of his insanity was stated to have been excess in smoking *charas*. No relative afflicted with insanity. No loss of memory perceptible.

No. 44. *Harnam, admitted* 3*rd April*, 1901, *æt.* 30.—Insanity following on excess of *bhang*. Broke several railway signal lamps in a state of mania, greatly excited, restless, constant talking. Loss of memory of occurences after the excess of *bhang*, which he himself owns to. No family history of insanity. Discharged sane 13th August, 1901.

No. 45. *Abdul Jalal, admitted* 19*th April*, 1901, *æt.* 40. —History of insanity following excess of *charas*. A well educated man, admitted in a state of mania, excitable, incoherent, irritable, and violent. Memory good This man himself owns to his habit and to having been several times confined for violence while under the influence of *charas*. Discharged sane, 13th August, 1901.

No. 46. *Mahamad Din, admitted* 1*st May*, 1901, *æt.* 25.— This man's father and family are well known to me; there is absolutely no hereditary taint, but there is a clear history of indulgence in *bhang* and *charas*. Acute mania, noisy, naked, restless, destructive— burnt houses, incoherent. He himself attributes his insanity to one excessively large dose of *bhang* taken at the instigation of a *fakir*. Loss of memory of some period following this. Discharged sane and has remained so.

No. 47. *Ilias-ud-din, admitted* 1*st May*, 1901, *æt.* 35.— A criminal lunatic, shot his mother-in-law, strong history of excess in hemp drug, by family and others also stated that he spent two annas every three days on the same. Originally a *sowar*, left his regiment on account of this habit. No family history of insanity or nervous disease, subject to fits of violence, passion and rage. Originally a very transient mania. Sane, still in the asylum. Later, July 1904, is developing melancholia.

No. 48. *Sukhai, admitted* 17*th May*, 1901, *æt.* 25.—A syce when admitted in a state of mania, naked, restlessly wandering about, speech incoherent, assaulting people without provocation, subject to fits of voluble excitement. Sane by 15th April, 1902. Discharged; owns himself to taking a pice worth of *charas* daily for a long period. No heredity.

No. 49. *Gharu Sing, admitted* 20*th May*, 1901, *æt.* 32.— This man had a history of insanity in his family Father was insane, but there was a clear history which he himself corroborated of having been in the habit of taking *bhang* and *charas*, preferably *charas*, for some three months, spending two pice to one anna a day on it Admitted maniacal, could understand nothing, constantly talking incoherently filthy, excited, destructive, bad memory. Delusions of travel and injury. Recovered. Discharged 2nd December, 1902.

No. 50. *Ram Dass, admitted* 1*st June*, 1901, *æt.* 22 — History of excess in *charas* and *bhang*, violent behaviour, attempted arson and assault. Symptoms passed off in some 24 hours. Discharged after 10 days' observation. No family history of insanity.

No. 51. *Nihala, admitted* 7*th June*, 1901, *æt.* 40.— History of insanity in mother's family—but clear history of indulgence in *bhang* and *charas*, and of his insanity following this (but nothing definite could be given). Mania filthy habits, went naked, tore up all his clothing, incoherent chattering. Sleepless and noisy, memory bad (previous attack in 1885, when he killed a boy. (May 1892 to May 1893, in Lahore asylum.) Delusions of great wealth. Still in the asylum.

No. 52. *Naranga Dass, admitted* 12*th June*, 1901, *æt* 26.—A Brahmin, whose mother was insane, but who was addicted to the *charas* habit. Certified, cannot understand simplest questions, constantly naked, regardless of physiological wants. Extremely filthy, very aggressive and later suicidal. Speech was an incoherent mixture of English and Urdu, sleeps badly, constantly gesticulating and in movement. Delusions, not possible to test memory Became melancholic. Discharged improved, 31st January, 1901.

No. 53 *Dewa Singh, admitted* 24*th June*, 1901, *æt.* 30. —There is a history of this man having lost his wife who ran away from him a year ago, but his insanity of a few weeks' duration in reality followed excess in *bhang* drinking. Symptoms are defective memory, assaulting the others, very self-willed, and violent, tears off the dressing from his wound. Discharged sane, 5th July, 1902.

No 54. *Ganga Singh, admitted*, 30*th June*, 1891, *æt.* 50. —A beggar, insanity of a year's duration, following *charas*, *bhang*, and opium excess, incoherent speech, violence. Delusions of great possessions, constant incoherent talking. Not possible to test his memory, his speech in reply being so incoherent. Still in asylum.

No. 55. *Kamar Ali, admitted* 30*th June*, 1901, *æt.* 35.— History of his being addicted to *charas* and intoxicants Since his admission has been in state of chattering incoherence, very violent and aggressive at times. Continually asking for *charas* with his food. He is so incoherent that it is not possible to test his memory. Delusions are not evident, nor is it possible to obtain a family history.

No. 56. *Phul Ram, admitted* 7*th July*, 1901, *æt.* 30 — History of excess in *bhang*. No history of insanity in family. Brought in with a history of acute mania, but became sane immediately after admission—except for a distinct loss of memory. Four previous attacks of a similar character.

No 57. *Datta Ram, admitted*, 22*nd July*, 1901, *æt.* 26.— History of excess *bhang* and *charas*. History of acute mania, violence, noisy excitement, rambling speech; killed his uncle with a blow from a hatchet; of this he has now no memory. Still incoherent, mutters nonsense, silly and weak-minded.

No 58. *Devi, admitted*, 29*th July*, 1901, *æt.* 30.—An *ekka* driver, attributes insanity to excess in *charas*. Maniacal (goes naked, filthy habits, talking incoherently, violent to others, restlessness and self-complacent). No family history of insanity, etc., remained insane all 1902, but recovery early in 1903.

No. 59. *Harnam Singh, admitted* 28*th August*, 1901, *æt.* 18 —A sepoy, 29th Bengal Infantry, found wandering in Lahore bazar, would only answer "Hai jee;" next few days gradually recovered, gave his name and address, and states that he was on casual leave from his regiment from Peshawar, and on night of leaving took some *bhang* which completely stupified him, after which he did not remember anything until waking up in custody. Discharged sane.

No. 60. *Ram Het, admitted* 23*rd August*, 1901, *æt.* 18.— This man attempted to cut his own throat and succeeded in inflicting a severe wound on himself. He has no recollection of the occurrence or of subsequently tearing of the bandages to re-open it. Since admission beyond being somewhat melancholic, he is practically sane. History of excess in *charas* following on grief. No family history of insanity.

No. 61. *Atra, admitted* 24*th August*, 1901, *æt.* 50.— History of excess of *charas* following on domestic troubles becoming maniacal as a result. Furious fits of excitement in which he attacked people. Destructive to property, sleepless, noisy, and restless. Stood on a railway level crossing threw stones at, and abused the passers-by, drifted into a condition of chronic mania, with outbursts of violence. No loss of memory for above period. No delusions.

No. 62. *Nizam Din, admitted* 29*th September*, 1901, *æt.* 36.—Clear history of excess in *bhang* and *charas* for a long period. Delusions of being ordered by God to do various acts, to destroy property, etc. Extremely exalted and self-complacent, excessively loquacious, owns himself to taking 2 pice worth of *charas* daily. Recovered. Second attack January, 1903, following a recurrence of his habits. Again recovered, memory unimpaired.

No. 63. *Bahadur, admitted* 2*nd October*, 1901, *æt* 28.— No family history of insanity. Relatives state that he became insane at Agra as a result of associating with *fakirs* with whom he used to smoke *charas*, while in this condition assaulted a servant and tried to force his way into a European house; following this he became melancholic for a few days and rapidly recovered. When seen a year later was sane. Has not resumed the *charas* habit.

No. 64 *Allah-Ditta, admitted* 11*th October*, 1901, *æt.* 35 —This man on his return from Africa, where he had been for work for three years, took up with a prostitute in Lahore city and began to take excess of *bhang*. Became maniacal, found wandering about the city, very violent and aggressive, extremely suffused eyes, rubbed himself all over with filth, went naked, tore any clothing given

to him. Rapid recovery followed admission. No loss of memory, but three months later another outbreak of mania occurred, from which he became weak-minded. No family history.

No. 65 *Chela, admitted* 18*th October*, 1901, *æt.* 23.—Criminal lunatic, grievous hurt, having made a furious assault on his wife. The man owns to an excess of *bhang* drinking. His uncle was also insane, but in his case he too used to take 2 tolas of *charas* daily, and was in the habit of smoking day and night together for long periods. Very noisy and filthy—went naked, destroyed clothing, etc, abused everybody No idea of time—sleepless, ideas of grand possessions in money, land and jewels. Rapid and complete recovery after admission.

No. 66. *Mela, admitted* 15*th October*, 1901, *æt.* 35.—A shopkeeper at Amritsar. No family history of insanity or epilepsy, history of prolonged excess in hemp drugs, which he himself owns to when sane. Under treatment from 31st December 1898 to May 1899, when he was discharged sane. At that time found in a railway carriage wearing the clothes of a guard which he had stolen. No recollection of the occurrence. Very quarrelsome, noisy, with delusions of wealth and influence, etc. On another occasion he was seized in Lahore city as he was throwing stones about and attacking people. Admitted in a condition of wild mania, perfect recovery and discharged sane 4th April, 1902. Again admitted 26th May, 1902, with bruises and injuries, in a state of furious mania He recovered in three months, and then owned that in the interval he had obtained employment as a brass engraver, and kept well up to a fortnight before admission, when after an excess of *charas* he neglected his work, etc., and quickly became maniacal Kept sane until discharged, 11th May. 1903. Seen in March, 1904, quite sane, has not resumed his habit.

No. 67. *Takar Das, admitted* 17*th February* 1902, *æt.* 45—This man is a *fakir* and well known to be an excessive *bhang* and *charas* taker, though his mother was insane, and he is said to have an insane son. I have known the man for the past three years, and know that each attack of mania has followed directly on an excess of hemp drugs. On the first occasion he was arrested and convicted for a furious assault while in this condition, and was then in a state of intense excitement with suffused face and eyes, shouting, talking, and most destructive. He was again admitted to the asylum on 17th February 1902, on each occasion rapidly recovering when his supply of hemp drugs was cut off. As stated he is well known to be a violent destructive man, who in his frequent fits of intoxication becomes acutely maniacal (has never had any head injury or sunstroke). He himself states that he can take 2 tolas of *charas* in a day, and as he is a fairly wealthy man frequently does so.

No 68. *Harnam Singh, admitted* 14 *February*, 1902, *æt.* 45.—A case of mania following excessive use of opium and *bhang*, the latter however chiefly, as well as a large amount of *charas*. No family history of insanity. Admitted maniacal, restless, noisy and talkative, most destructive. Speech so incoherent that it is impossible to test his memory. No delusions. Passed into a state of chronic mania characterised by constant noisy incoherent talking, dirty habits, foolish grimacing, and generally silly behaviour. Always in a state of chronic mania—23rd December, 1903.

No. 69. *Tulsi, admitted* 7 *March*, 1902, *æt.* 22.—A notorious *charas* eater. No other cause assigned for his insanity. No family history. Acute mania., restless, filthy, incoherent, emotional and violent; speech so rambling that it is not possible to test his memory, passed into a condition of chronic mania. Still in the asylum.

No. 70. *Shibu, admitted* 9*th March*, 1902, *æt* 22 — Arrested in a state of mania at Thannaesar fair, history of *charas* eating, certified as sleepless, restless, and noisy, incoherent and filthy, fits of violence and destructiveness. No loss of memory, rapid recovery immediately after admission. No family history of insanity.

No. 71. *Prema, admitted* 9*th March*, 1902, *æt.* 28.—On recovery to being an habitual *charas* eater and that he was in the habit of taking 1 chittack, *i.e.* one-fifth per man, daily in company of five men Is a sweeper, admitted in a state of acute mania. Speech unintelligble, very restless, filthy, and destructive. Delusions and memory could not be tested. No sleep, recovery in six months. Discharged sane October, 1902.

No. 72. *Sardhara, admitted* 7*th April*, 1902, *æt.* 23.—When sane 21st January, 1903, he admitted that he was in the habit for over a year previously of taking 2 pice worth of *charas* daily. Admitted in state of mania, restless, especially at nights, shouting and screaming the whole night, impossible to test his memory or delusions, went naked, speech incoherent, very destructive to clothing. The amount of *charas* this man used to smoke (always with tobacco) worked out at half a tola a day. No insanity in family or nervous disease. Complete recovery December, 1902.

No. 73 *Atma Singh, admitted* 10*th April* 1902, *æt.* 36.—Certified to being in a state of acute mania. The man himself stated aferwards that he was a wandering *fakir* from Nabba, that he came to Rawalpindi about the Dassera and while under the influence of *bhang* was arrested as a lunatic. Sane on arrival.

No. 74. *Rahim Bux, admitted* 16 *April* 1902, *æt.* 25.—A doubtful history, his grandfather having been insane or epileptic, but no other member of his family. He himself gives a clear history of his insanity following excess in *charas* and owned to taking 6 *mashas* a day of *charas* and a tola of *bhang*. Simple mania destructive, restless, noisy, emotional, very exalted Recovery.

No. 75. *Gunga Ram, admitted* 13th *May* 1902.—Cause "charas smoking," suddenly jumped into a guard's van and persisted in remaining there, and assaulting passengers at a station. On admission in a state of violent mania, filthy, screaming, shouting, struggling with those around him, speech so incoherent that it is impossible to test his memory. Passed into a state of chronic mania. No family history of insanity.

No. 75*a. Kishen Singh, admitted* 23 *July* 1902, *æt.* 30.—A returned coolie from Mombassa, returned as insane. After recovery he attributed this to heat and fever, but as he had at no time an enlarged spleen, and never suffered to any one's knowledge from ague, and owned to having been in the habit for four years of taking *charas*, a "*ratti*" daily, and lately while in Africa *ganja*, and as there was no insanity in family nor other apparent cause, it is probably a hemp drug case. His primary symptoms were unknown, but on first arrival in India his case was noted as melancholia, but he was troublesome, and damaged the hospital property. He was admitted here in a state of melancholia silent, never moving (his legs were contracted from disuse) passing everything under him, but he obviously understood and obeyed some orders, and ate well. Complete recovery mentally, and physically as to flexing of thighs in 12 months.

No. 76. *Sheria, admitted* 14*th May* 1902, *æt.* 32.—A clear history of having come from Kabul to Peshawar, and then developing insanity after excess in *charas*. He has remained in this condition some 16 years (a brother who was his companion in the habit also became insane). Family history of parents, etc., unknown. Incoherent, foolish, occasionally violent and aggressive, filthy, indecent and destructive. Has remained in a state of to chronic mania since admission.

No 77. *Purdan Singh, admitted* 13*th June* 1902, *æt.* 35.—This man as to whom, when sane, minute inquiries failed to find the slightest evidence of insanity in family, was known to have been for two years addicted to excess of *bhang* and himself owned to taking in solution 1 *chittack* at a time. When admitted he was silent and statuesque, made grimases but when alone shouted chattered, and bawled and did not sleep (filthy habits later on). After four months gradually improved sufficiently be handed over to the care of his friends.

No. 78. *Ramgir, admitted* 7*th July* 1902, *æt.* 16.—Cause stated to be his habit of smoking *charas* in large quantities No family history of insanity or epilepsy; when admitted talkative, destructive, indecent, very excitable

and incoherent. Sleepless at nights, careless of dress and cleanliness. Rapid recovery. Sane by 1st October, 1902.

No. 79. *Parmesari Das, admitted 9th July* 1902, *æt.*, 50. —A clear histery of prolonged *charas* eating, 16 grs. a day for three years, without any family history of insanity or epilepsy. This man had impoverished himself by his dissipated habits; became maniacal, attacking females, destroying clothing, extremely restless and excitable, injured himself in this condition. No memory of the occurrence. No idea of time or place Death by exhaustion. Delusions of great wealth.

No. 80. *Kodo, admitted 10th September* 1902, *æt.* 25 — Arrested for throwing charcoal in the porch of a school, he stating that he had an order from God to do so. Extremely restless, never still for a moment, very noisy, chattering and grimacing continually. No loss of memory. He himself owns to being for a long time addicted to *charas*, spending on that one anna a day or as much as he could get He has previously been insane in 1898 and 1899, with the same history. On this occasion he rapidly recovered and was discharged sane in November. In September of the next year, after again reverting to his former *charas* habit, he was arrested for running off with another man's coat, when in a state of maniacal exaltation and brought back to the asylum in exactly the same condition as before. He commenced to recover in about a month.

No. 81. *Abdulla, admitted 27th October* 1902, *æt.* 40.— Sent in with a history of suddenly seizing people by the throat, excessive talking and being abusive, wandering about naked, etc. No loss of memory, no delusions. He himself states that he will eat any amount of *charas* we will give him, and that he habitually smokes two annas worth a day. He has been three times in an asylum previously, always as a result of *charas*. No. heredity

No. 82. *Maru, admitted 11th November* 1902, *æt.* 20.— This man, when sane, denied any heredity of insanity or epilepsy, etc., and persisted in attributing his insanity to "sulfa" (hemp). He was certified as being offensive and dangerous to others when under the influence of *charas* and that his mental symptoms were in relation only to that drug. He made a rapid recovery. No loss of memory or delusion.

No. 83. *Amrat, admitted 11th November* 1902, *æt.* 30— The cause of this man's insanity was stated to be excess of *charas*, a fact repeatedly testified to by his father, and owned to by the man himself when sane, when he owned to having been in the habit of taking one pice worth of the drug daily. He was in a condition of simple mania, excitable, dramatic, delusions of relationship with Europeans, etc. Delusions of great age, and power of memory. Rapid recovery.

No 84. *Nur, admitted 12th December* 1903, *æt.* 24.— Given to setting fire to houses and property, assaulting females and abusing people, of all of which he had no recollection later. He was also incoherent, talkative, restless. and filthy. No delusions. When sane he volunteered the statement that for a month previous to his admission he had been in the habit of taking four annas worth of *charas* daily (quarter of a tola). No other cause was discernable and there was no history of insanity or epilepsy in the family.

No 85. *Hayat Mahamad, admitted 26th November* 1902, *æt.* 25 —Admitted in a condition of simple mania, from which he rapidly recovered. He absolutely denies any insanity in any member of his family, when sane he stated that for about a year he had been in the habit of taking *charas*, one pice worth daily (to make his food digest), that he always smoked in company, that one pice worth would suffice for four or five men, that one smoke was sufficient to make a man "*nasha*" for 24 hours.

No. 86. *Gurdit Singh, admitted 1st April* 1903, *æt.* 25. —Arrested when insane for attempting to scale Fort Lahore walls History of insanity of sudden onset. Extremely restless, talkative, and excited. No recollection of the acts that led to his arrest. History of long continued small excess in *bhang* (the man was a Sikh). No family history of insanity, etc

No. 87. *Maula Bux, admitted 15th June* 1903, *æt.* 30.— His family deny all heredity of insanity or nervous disease and no cause is discernable in this man, beyond that asserted by them, excess in *bhang*, he having been in the constant habit of spending one to four pice daily on it. Symptoms acutely maniacal, destructive, constant talking and abusing. Speech so rambling and incoherent that it is impossible to test his memory or delusions. Very filthy habits. Attacks of violence to those about him. Complete recovery in one month.

No. 88. *Badri Pershad, admitted 17th June* 1903, *æt.* 25.—Was found in Delhi bazar assaulting and abusing people, throwing stones, etc. He was unknown and talking so rapidly and incoherently that nothing could be made out of him. He went naked, and was filthy in his habits, and got very little sleep. Complete recovery by the third month. When sane he owned to an excess in *bhang*, 2 tolas daily, and denied any other cause, or there having been any heredity of insanity or nervous disease. His memory of his past acts is almost *nil*.

No 89 *Mehtab Singh, admitted 27th June* 1903 *æt.* 30 —An attendant at a Dharamsala, addicted for a long time to the daily habit of taking one to four pice worth of *charas*. His family history is not obtainable. Shouting, noisy, and excited. Speech so rambling that it is impossible to understand him. Never still for a moment He improved greatly after the first month, but has now relapsed and though not so noisy and excited, is still foolish and incoherent.

No. 90. *Buta Singh, admitted 3rd July* 1903, *æt* 25.— Arrested for having committed a theft, and behaving insanely while under the influence of hemp drugs, a habit which he had indulged in for a long period and in which he had lately exceeded. In a state of simple mania, exalted, talkative, no power of fixing his attention, restless and silly in behaviour. Rapid recovery— 9th September, 1903. No recollection of his arrest, etc. No insanity or epilepsy in family.

No. 91. *Umara, admitted 7th July* 1903, *æt.* 45.— Owned to being addicted for 2½ years to *bhang* and *sulfa*. Absolutely no trace of insanity or nervous disease in family. Arrested at railway station acting foolishly, breaking the seals off railway waggons, etc., very excited and exalted, shouts loudly, talks rapidly, loudly, and incoherently, as though always in a violent excitement. No recollection of his arrest. Very destructive, tears in pieces everything he can touch; slowly improving, now only noisy, complacent and excitable.

No. 92. *Ghulam Mahamad, admitted 8th July* 1903, *æt.* 25.—Admitted with a history of having fired his own house, beaten his children without reason, smashed windows, etc. Foolish, rambling speech, subject to violent fits of passion, very destructive. No recollection of his acts before admission. No insanity or epilepsy in family. No obvious cause of his insanity. Owns himself to have been addicted to *charas*. Rapid improvement.

No. 93. *Natha Singh, admitted 21st July* 1903, *æt.* 50.— Admitted in a state of violent mania, gesticulating, excited and (though a Sikh) constantly shouting for tobacco and *charas*, constantly talking, delusions of great strength and ability. Clear family history, no insanity or epilepsy, no cause traceable but also a clear history owned to by himself of excess in hemp drugs and spirits. The man himself owned later that the slightest excess in hemp drugs would make him "*behosh*," and that each of his two previous attacks of insanity have followed excess of *bhang*. Sane, January, 1904.

No 94. *Karim Bux, admitted 22nd October* 1903, *æt.* 34 – Voluntarily states when sane that for a long time he had been addicted to *charas* by "*chillum*," one to two pice expended daily, but that he took as much as he could get. No insanity or nervous disease in family No other probable cause discoverable. This man had given up to his brother his share of the land and turned *fakir*, and since then had taken to *charas*. Insanity, mania of acute onset, went naked, fell down a well, incoherent

and rapid talking. Memory of these occurrences doubtful. Rapid recovery in a few weeks.

No. 95. *Nur Ahmed, admitted* 28*th October* 1903, *æt.* 20.—History of having been brought to police by his own father as a dangerous lunatic, in the habit of abusing and assaulting people, tearing his clothes, talking incessantly, subject to fits of passion. After admission he remained acutely maniacal, filthy with curious daily exacerbations, remaining for some hours in the interval quiet and amenable. Cause stated in Police report to have been excess in *charas*. He is still however insane though improved. No family history of insanity or nervous disease His brother has told me that for the past year he has got into bad company and has become an inveterate *charas* smoker and spirit drinker.

CASUALTIES IN ACTION IN TIBET.

By C. N. C. WIMBERLEY,

MAJOR, I.M.S.,

Comdg. No. 71, *Native Field Hospital.*

During the last few months, while serving with the Tibet Mission Force, a certain number of casualties occurring in action have passed through my hands. As the variety of wounds has been somewhat curious, owing to the varied nature of the arms in the hands of the Tibetans, some details of a few cases may be interesting.

I should state that all the wounds were recent, being first attended to by me at a dressing station, and afterwards taken back to the Field Hospital for treatment.

In all 83 cases have passed through my hands, which may be tabulated as follows :—

		Killed in action	15
		Wounded	68
		Died of wounds	7
Of the 15 killed	13 were due to gunshot wounds	Head	
		Chest	4
		Abdomen	1
	1 was due to multiple sword-cuts.		
	1 was due to fracture of skull from a stone.		
Of the 68 wounded	51 were due to gunshot wounds	6 dangerous	
		24 severe	
		21 slight	
	10 were due to sword-cuts	4 severe	
		6 slight	
	7 were due to stones hurled by the enemy	2 severe	
		5 slight	
Of the 7 who died, all were cases of gun-shot wounds—			
		Of the Abdomen	2
		,, ,, Chest	2
		,, ,, Shoulder	2
		,, ,, Thigh	1

Detail of Cases.—*Case I.*—A European received numerous sword-cuts at the action of Hot Springs on the 31st March. On the field all that could be done was to stop hæmorrhage, including severe bleeding from the temporal artery, and cover up the wounds with temporary dressings. Next day under chloroform it was found necessary to disarticulate the left hand at the wrist joint, as the tendons and all the metacarpals had been severed by a sword-cut on the back of the hand, and the hand at the same time cleft in two nearly down to the wrist joint by a second sword cut, which entered between the ring and middle fingers.

A third cut had divided most of the extensor tendons on the back of the right hand without injuring the bones. These were carefully sutured, though some of the tendon ends which had retracted could not be found, the distal end of the extensor indices tendon having to be united to a slip separated from the extensor tendon of the middle finger.

A wound of the scalp and of the leg were also sutured, the latter cutting deeply into the head of the left fibula. The whole operation was carried out in a tent in a severe sand-storm, which was not conducive to asepsis. The patient was sent back down the line. All the wounds healed kindly except in the case of the stump of the left hand, where some trouble occurred, apparently due to a small spicule of enamel from the reservoir of an irrigator used during the operation having been left in the wound. This had subsequently to be removed. He has since rejoined the Force in robust health, with a perfectly useful right hand, in which the movements of the fingers are as good as ever.

Case II.—A Sepoy of the 32nd Pioneers was wounded at the Zaindang Gorge on the 10th of April, being shot in the left forearm by a matchlock at a few yards' range. The bullet had almost an explosive effect. There was a small wound of entrance near the middle of the shaft of the left radius, but the ulna was shattered and splintered for some three inches, and a large flesh wound of exit, four inches long, was found on the ulnar side of the forearm, through which muscles and tendons bulged. Many detached splinters of the ulna had to be removed, and the wound very slowly filled by granulations, numerous sloughs of tendons having to be snipped off from time to time. He was eventually, at the end of May, sent back to India with a small sinus remaining, and a mass of callus round the damaged ulna.

Case III.—A Sepoy of the 32nd Pioneers was wounded in the chest at the Karo-la on the 6th May, the bullet, apparently a rifle one, passing clean through the right side of the chest from before backwards about the level of the fourth rib. After being hit he lay out on the hill-side in a snow-storm for some hours. When brought in he was much collapsed, but rallied next morning. Unfortunately on that same day he had to start back in a doolie towards Gyantse, to which place the Force was returning He did well, however, all that day, but on being taken out of his doolie at 4 P.M. on the next day at the end of a long march of 20 miles, he was found collapsed, pale and breathless, and died shortly afterwards, apparently from internal hæmorrhage. I cannot help thinking that if he could have been kept quiet, he would have done well. But such are the exigencies of war.

Case IV.—A sepoy of the 32nd Pioneers was wounded in both legs at the Karo-la on the 6th May, apparently by a "Lhasa Martini" bullet of about ·550 bore. The bullet passed through the muscles of the calf of the left leg, disorganising them a good deal, and, entering the right leg, shattered the tibia in its lower third exten-

sively. He was brought back three marches to the Hospital at Gyantse and housed in a Tibetan building, where the Hospital had to be located to be safe from *jingal* fire from the *jong*. The wounds became putrid, stinking most offensively, and large bullæ formed over the right foot and ankle. The best treatment would have been immersion in a bath of weak antiseptic lotion, but there were no appliances for this at hand. In default, the limbs were kept wrapped in lint soaked with corrosive sublimate solution 1—5000, and covered with guttapercha tissue, the dressings being frequently changed. By this means, and with the help of a liberal diet, he eventually did well, and when sent back to India had merely a sinus leading down to some carious bone in the right tibia.

Case V.—A private servant, while standing at the Hospital door at Gyantse, on the 8th May, was struck in the left hip by a large *jingal* bullet, weighing about 3 lbs. The head of the left femur, and probably the acetabulum and pelvis were smashed to atoms, and he never recovered from the initial shock but died in a few hours.

Case VI.—A sepoy of the 32nd Pioneers was hit in the post at Gyantse, on the 12th May, by a dropping *jingal* bullet. The bullet entered in the right supra scapular region, passed down under the skin, and was removed through an incision made just below the angle of the right scapula. It weighed about 8 ounces. A few days later the patient exhibited a large tender swelling in the right loin, sharply bounded by the crest of the right ilium. A hæmatoma had formed from blood which had gravitated down under the fascia. It was slowly absorbed.

Cases VII & VIII.—Two men of the 8th Gurkhas were wounded at the taking of the "Gurkha Picquet" at Gyantse on the 19th May. They were both struck by stones hurled on their heads by the defenders, and not wearing *pagris*, each received a very nasty lacerated confused scalp-wound. However, the skull, though bared, was not fractured in either case, and they both did well and recovered quickly.

Case IX.—A mounted-infantry man of the 23rd Pioneers, who was with others carrying the dâk, was wounded on the 19th May some three miles from Gyantse. He received a gunshot wound of the right hand, which necessitated the removal of parts of the thumb and two fingers, which were extensively damaged. He also had a second gunshot wound in the region of the bend of the left forearm. Here the bullet had not emerged, so the wound was enlarged, and a small match-lock bullet, not much larger than a slug, but wrapped round and round with dirty tow to make it fit the bore of the weapon, removed. The wound was well washed out with carbolic lotion, but two days later the whole surface of the wound was found covered with a layer of a yellow unctuous looking material, evidently a pure culture of some microrganism, possibly the *staphylococcus aureus*. No microscope was available to corroborate this. Some symptoms of grave septic absorption set in. On the 25th, a sudden severe hæmorrhage occurred from the wound in the bend of the elbow, and before I could arrive, he had lost apparently about two pints of blood. A tourniquet was at once put in, the man got under chloroform, and the left brachial tied in the middle of the upper arm. At the same time the wound at the elbow was again cleaned and scrubbed, and all clots turned out.

A few days later a second slight hæmorrhage occurred from the same place, but was controlled by a tourniquet above the elbow. But as these slight hæmorrhages recurred several times, he was, on May 30th, for the third time put under chloroform, the wound at the bend of the elbow opened up, and every bleeding point that could be found tied, the wound being swabbed with a solution of chloride of zinc.

Thereafter he slowly recovered, but not without all the finger stumps breaking down and several abscesses forming in various parts of the body, which had to be opened and drained. Eventually his temperature fell to normal, the various wounds became clean and began to heal, and when I left Gyantse in the middle of July he was walking about, a shadow of his former self, but convalescent. I should mention that he too had to be housed in a Tibetan building, where a short time before many very severe septic burn cases had been treated—the result of a gun-powder explosion.

Case X.—Another sepoy of the 23rd Pioneers was wounded at the same time in the left foot. There was a small wound of entrance, about 1 inch below and 1 inch in front of the left internal malleolus. This was also cut down on, but though an extensive search was made in and between the tarsal bones the bullet could not be found. In this, as in several other cases, a portable X-ray apparatus was badly needed. He was sent back with the bullet still lodged.

Case XI.—A man of the Bengal Sappers and Miners was shot right through the neck at Pahla, on the 26th May, by some small high velocity projectile, apparently from a mauser pistol. So far as could be made out the bullet must have passed between the pharynx and the vertebral column. A first field dressing was applied on the spot. When removed, only a small scab was found on either side, and the man was discharged to duty about a week later, complaining only of slight stiffness in the neck. This was a case which illustrates the wonderful way in which a modern projectile will pass through vital parts without doing any damage. It also shows how well such wounds do when the first original dressing is left alone. But let me add a note of experience with regard to these first field dressings. It is this. *Throw away all the guttapercha waterproof tissue supplied. The drier such wounds are kept the better.*

Case XII.—A Lance-Naik of the 32nd Pioneers was shot in the region of the left shoulder joint on the 26th May. The head of the humerus was shattered, but the vessels and nerves had escaped. His arm was strapped to his side with the hand on the opposite shoulder after the wound had been dressed. He complained of much pain, for which morphia was given, but otherwise seemed to be doing well. On the 28th May I was out the whole day on a military expedition, and on my return in the evening was astonished to hear that he had died suddenly that morning, and that his corpse had already been burnt. I am quite unable to speculate as to the cause of death.

Case XIII.—A man of the 8th Gurkhas, who was running through a number of rifles lying on the ground on the 26th May, tripped over one, which went off, and was thus accidentally shot by one of our own Lee-Metford bullets. The bullet took an extraordinary course. It went right through the muscles of the left calf, entered again at the inner part of the left thigh suspiciously near the femoral artery, emerged at the front of the left thigh in its upper third, entered again just below the spine of the left ilium, and after a track of 3 inches under the skin, finally emerged at the back of the left loin. The skin at this last part broke down, leaving a long shallow ulcer, which granulated. The other wounds healed quickly.

Case XIV.—A Havildar of the Bengal Sappers and Miners was sitting cooking his food in the Gyantse Post, with his back to a substantial protective traverse made of logs and stones. A large *jingal* bullet weighing 4lbs.—a "Big William" as it was generally known in Gyantse—passed through the traverse, grazed the inner side of his left forearm and adductor surface of his left thigh, and finally buried itself in the ground just between his legs. The skin showed extensive bruising, and finally a large area on the inside of the thigh sloughed, leaving a large shallow ulcer.

The above show in some degree the variety of cases we have been called on to treat. I may add a few words about a couple of cases of interest, which have since occurred, though not cases of wounds in action.

On the 2nd of August, a Sepoy of the 32nd Pioneers, was asleep in a tent on picquet duty with several others. He was awaked at about 2 A.M. by a comrade for his turn of sentry-go, and just as he was turning round, preparatory to rising, in some unaccountable manner a Lee-Enfield rifle lying on the ground about 8—10 inches from him went off. The bullet entered by a small hole in the back of the left carpus and emerged in the left forearm above the wrist. At the wound of exit was a long triangular clean cut tear of the skin, some 3 inches long. It seemed as if the bullet had simply burst out through the elastic skin, tearing it over this extensive area. The muscles or tendons were not damaged. Another interesting point is that although the rifle was discharged at this short distance from the bare skin of the back of his hand, there was no sign of singeing or of particles of powder near the wound. It would have been impossible to say from an examination of the wound that the rifle had not been discharged at a distance of 100 yards.

Lastly, the case of a Tibetan interpreter with the Force, who went into Lhasa contrary to orders the other night, on a private enterprise from our camp here.

News was brought in next day that he was lying cut to pieces in a Tibetan house in the city. A doolie with an escort was sent for him and he was brought back to camp in the afternoon. He had been lying in a filthy Tibetan house for over 16 hours after he had been wounded, covered with dirty blankets, and with his wounds bound up with nondescript Tibetan rags.

He was found to have received no less than 10 sword cuts, most of them very severe, and must have lost pints of blood. Of two long scalp wounds, both grooving the skull deeply, one had divided the left temporal, which started spouting when the wounds were being cleaned and had to be tied, another cut went clean through the left radial, another opened the right wrist joint and so on. And yet now a week later, nearly all the wounds have healed by first intention, and he is walking about quite cheerful.

A Mirror of Hospital Practice.

A CASE OF FULL DEVELOPMENT OF A FŒTUS IN THE ABDOMINAL CAVITY, ITS DEATH, SUBSEQUENT REMOVAL BY ABDOMINAL SECTION AND RECOVERY OF THE MOTHER.

COMMENTS ON THE CASE.

By F. S. PECK,

LT.-COLONEL, I.M.S.

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MOKHADA, a Bengali Hindu, married, aged about twenty years, was admitted to the Eden Hospital, Calcutta, February 28th, 1902.

Personal History (obtained from her, her husband and uncle).—First menstruated at the age of twelve, periods regular, free, and lasting usually four days. Has been married nine years, and living with her husband during the last eight years. Up to the present has had no children nor miscarriages. Menses ceased in February 1901, the usual symptoms and signs of pregnancy following—morning nausea, salivation, breast changes, etc., with a gradual increase in the size of the abdomen. Quickening

was noticed about the fifth month, but she could feel no fœtal movements after the end of the seventh month. Had an irregular, very scanty discharge of blood commencing about the third or fourth month and continuing during the course of the gestation. Never had any severe pain, attacks of faintness, nor sensation of internal "giving way;" never any severe hæmorrhage.

Since the cessation of menstruation she suffered from frequent attacks of fever which, about December 1901, became very severe and assumed the remittent type. She was confined to bed and was prostrated until the beginning of January 1902, when she had pains and a profuse discharge—"about six pounds"—of blood mixed with pus from the vagina. After this discharge her condition improved, the fever disappeared and she was able to walk about in a few days, but a thick, purulent, yellowish discharge continued from the vagina, and about a fortnight before admission a swelling began to appear at the umbilicus.

Condition on Admission.—Medium in build, thin and cachectic in appearance. Temperature 97° F. in the axilla. Milk could be expressed from the breasts. There was a tumour in the abdomen, central in situation and reaching about two inches above the umbilicus, which felt like the pregnant uterus at term but rather harder. There was also a tender fluctuating swelling about the size of a walnut at the umbilicus. No fœtal parts nor movements could be felt, nor fœtal heart sounds heard. There was an offensive discharge from the os uteri which was soft and patulous. Sound entered about three inches. Under chloroform the cervix was dilated, uterus explored and found empty.

Operation.—On the morning of March 2nd, an incision three inches long was made midway between the umbilicus and pubes. A quantity of thick and offensive pus came out from the upper part of the wound, the incision was then prolonged and the gestation sac opened. The back of the fœtus was at once exposed, the head lying upwards in the left hypochondrium and the breech in the right iliac region, the legs were flexed on the body, which was curved upon itself; the whole being immersed in pus.

The fœtus was removed after a ligature had been secured at the placental end of the cord. It was a fully grown male, slightly decomposed, measuring twenty inches in length and weighing five pounds, ten and a half ounces.

The placenta, battledore in shape, very thin and membranous, was firmly attached and spread out over the upper part of the sac, extending more to the right than the left. The cord was attached to its left side.

The sac was entirely shut off from the rest of the abdomen. Above and behind was the stomach and transverse colon, behind and to its right the ascending colon and liver, its anterior and lateral boundaries were formed by the abdominal parieties. The floor was formed by two smooth rounded masses with the hypertrophied uterus, somewhat flattened at the top, in the centre. These lateral masses were composed of the small intestines pushed down and matted together in two separate bodies. No communication between the sac and uterus could be determined. The removal of the placenta was not attempted, as it was very thin and membranous; disturbing it would most certainly have been attended with severe and uncontrollable hæmorrhage. It was therefore left *in situ*, its further treatment to depend upon circumstances The cavity was thoroughly irrigated with a solution of izal and packed with izal gauze sprinkled with iodoform. The wound, save for a couple of inches at the top to permit of the cavity being irrigated and the packing changed, was closed with interrupted silkworm gut sutures.

Subsequent Progress.—The patient after a highly satisfactory course made an excellent recovery. During the evening of the second day after the operation she had a slight rise of temperature, *i.e.*, 100 F. She required but a small quantity of stimulants. During the first fortnight the cavity was irrigated twice daily with izal solution and loosely packed with iodoform powdered gauze. The discharge, which was thick, yellowish and free during the first week, continued to be offensive for some time, and on two or three occasions a few shreds came away. The vaginal discharge stopped completely from the third day after operation. The swelling on the left side of the uterus rapidly subsided, and a fortnight after the operation there was no tumifaction nor tenderness over the part. The swelling on the right side of the uterus was, however, slow in subsiding. From the third week the cavity was irrigated with a weak iodine solution; the discharge quickly diminished, the swelling and tenderness subsided. About April 27th, the wound completely closed. Before allowing it to close entirely it was carefully probed, and no sinus could be determined, the abdominal cavity being completely filled in with its viscera. The liver returned to its normal position about a week after the operation. The patient quickly regained her strength and was walking about within two months. Before her discharge a thorough examination was made; there was no trace of thickening in the broad ligaments, the sound entered slightly more than the normal distance and could be felt above at the site of the abdominal wound. The sac appeared to have become adherent to the fundus and, in its contraction, to have drawn up the uterus in a sort of ventro-fixation.

Remarks.—The most notable points in the case are the following:—

1. Absence of any sign or symptom, in the history, which pointed to or suggested a rupture of a primary tubal pregnancy.

2. Very high, firm and complete attachment of the placenta, and its subsequent fate.

3. The uninterrupted development of the fœtus, evidently up to full term.

1. The total absence of a history of early rupture leads one to believe it to be a case of so-called primary abdominal pregnancy, the possibility of which has been disputed. It is most difficult to believe that an intraperitoneal rupture could have occurred without producing any signs or symptoms whatever. This point was carefully investigated, but no history of anything simulating internal hæmorrhage or peritonitis could be elicited.

2. The very high attachment of the placenta indicates that the ovum either must have travelled or been propelled so far as to have been implanted on the stomach. It is highly improbable, if not entirely impossible, that an ovum some weeks old should have or could have travelled so high after rupture of a tubal pregnancy, the usual site of attachment in such cases being in the vicinity, more or less, of the tube. This fact also favors strongly the idea of a primary abdominal pregnancy. The subsequent fate of the placenta was somewhat obscure. It is evident that it was not expelled; probably part was disintegrated and discharged with the pus, the remainder may have been absorbed.

3. The size and weight of the fœtus clearly shows that the pregnancy continued to full term. In cases of intra-peritoneal rupture of a tubal pregnancy the ovum usually dies. In the present case the fœtus developed to full term in an intra-peritoneal sac, the sac walls being formed by the fœtal membranes adherent to viscera and abdominal parieties.

This case is instructive as illustrating the infinite resources of nature:—

First in the exercise of the reproductive function. That a membrane like the peritoneum should be able to assume the functions of the uterus, to nourish and develop a child to full term, tempts one to believe that a fertilized ovum may be fully developed in whatever part of the human body it may become implanted.

Secondly the fact that the patient's abdomen did contain a decomposing fœtus, intimately connected with her circulation and floating in several pints of the foulest pus, the whole undoubtedly teeming with pyogenic organisms, and that she should, at the time of and after operation, have shown no sign of septic infection, proves the extraordinary powers of self-protection possessed by the human system.

In considering the causation of general sepsis, it appears that this very power of defence is underestimated.

Writers, on puerperal sepsis in particular, lay great stress, and very rightly so, on the importance of minimising the possibilities of infection. But they do not as a rule call sufficient attention to the fact that a healthy constitution will usually defeat an invasion of pyogenic organisms, while a patient exhausted by protracted labour or hæmorrhage, will succumb to the introduction of a comparatively small dose of poison.

As regards the causation of ectopic pregnancy the waters have been hopelessly muddied by the assertion that ova are normally fertilized in the ovaries and tubes. The explanation of tubal pregnancy then depends on an assumption of partial obstruction, such as would permit of the passage of spermatozoa, but would bar the descent of the fertilized ovum through the tubes. This is obviously far-fetched and does not explain the possible occurrence of primary abdominal and ovarian pregnancies, although the existence of such conditions is practically proved. There is no proof that spermatozoa, under normal conditions, effect an entrance into the tubes at all. The discovery of spermatozoa in the tubes and ovaries of recently killed animals proves nothing, as this invasion is quite likely to be *post mortem*.

Supposing it is assumed that—

1. The ovum is normally fertilized in the fundus uteri.

2. That where the ovum becomes fertilized, there it adheres.

3. That the normal movements of the Fallopian ciliæ propel the ova into the uterus and also prevent the entrance of spermatozoa into the tubes. Then defective Fallopian ciliæ will account for the absence of ova in the uterine cavity and the usual preliminary period of sterility and also for the possibility of the entrance of spermatozoa into the tubes and consequent ectopic fertilization. Pregnancy will then occur at the particular stage of its journey at which the ovum meets the spermatozoon, in the tube, in the abdominal cavity, and even in the sanctuary of the ovary itself.

The theory of adhesion at the site of fertilization also has the merit of explaining another phenomenon, *viz.*, that of placenta previa. An ovum gravitates down to the neighbourhood of the cervix before it becomes fertilized. It there adheres to the endometrium, and the decidua serotina and placenta then develop.

The foregoing theory appears the simplest that has yet been put forward. There are no facts which disprove it, and it has the advantage of explaining the different phenomena of ectopic gestation and placenta previa, without assuming the necessity of pre-existing severe inflammatory conditions, and without straining the powers of imagination to a dangerous extent.

This theory has already been broached by Mr. Bland Sutton and the late Mr. Lawson Tait.

EXCISION OF TUBERCULAR GLANDS OF THE NECK.

By J. R. ROBERTS, M.B., F.R.C.S.,
MAJOR, I.M.S.,
Residency Surgeon, Indore.

THE rapid healing of wounds under modern aseptics, has, I think, given rise to a too bold dissection when the removal of masses of tubercular glands of the neck is concerned. Large incisions throwing back a flap are advocated, and the division of muscle to make way is considered in many cases a necessity, if the glands lie deep down on the carotid sheath. Under these circumstances the division of vessels gives rise to a considerable amount of hæmorrhage, and the operation is one that the novice undertakes with a certain amount of apprehension, as he pictures before him the complicated anatomy of the neck.

At the Charitable Hospital, Indore Residency, it has been our practice to remove masses of tubercular glands by small incisions and by the aid of dissectors and manipulation to make these glands present themselves under the wound for removal. Time after time it has occurred that not a single vessel has required ligature though the chain of glands on the carotid sheath have been excised and the internal jugular vein laid bare, as well as a group or groups in the posterior triangle; and I have not known it to be necessary to cut the sterno-mastoid in any single case, though the glands lay underneath this muscle. Although the neck may be loaded with enlarged glands, their removal becomes an operation in which all thought of the anatomy can be put aside, and the beginner can proceed with perfect confidence.

It is necessary to be equipped with the following instruments:—

(1) One Watson Cheyne's fine dissector,
(2) One Smith's cleft palate raspatory,
(3) One Jameson Johnston's gland enucleator,
(4) One Cumins' gland forceps,
(5) One Macewen's periosteal elevator with blunt point,
(6) One pair of straight blunt pointed eye scissors.
(7) Two pairs of rat-tooth artery forceps,

in addition to the usual instruments for these operations, such as scalpels, Spencer-Wells' torsi-pressure artery forceps, blunt retracting hooks, dissecting forceps, &c.

Thus, let us take a case which is an example of the many; a group of glands under the jaw, another along the carotid sheath, another in the upper portion of the posterior triangle, another in the subclavian triangle, in an adult of 18 years of age. For these there will be required an incision from one to two inches over the submaxillary triangle, parallel with the lower jaw; another along the anterior border of the sterno-mastoid of about two or three inches, another vertical or even horizontal in a crease of the neck over the upper part of the posterior triangle, and another vertical one over the subclavian triangle avoiding the posterior jugular vein. Proceed as follows, make your incision, put torsi-pressure on the small superficial vessels, cut, divide the deep facia, make one assistant retract with blunt hooks, and another push the gland by pressure from the outside, so as to endeavour to make the gland present. Seize the cellular tissue of the neck with a pair of torsi-pressure forceps and pull it out through the wound; feel for the gland with your finger, and with a blunt dissector tear the cellular tissue; tear this until the gland surface is exposed, then with the same dissector, or the raspatory mentioned above, strip the cellular capsule off the outside of the gland, keeping close to the gland surface, sweeping round and round so as to free it. To get at the under-surface pull with dissecting forceps on the capsule so as to tilt up the gland; if free enough it can then be seized with gland forceps and pulled out of the wound. The last shreds of capsule can be torn off with a dissector or divided with the straight blunt eye scissors; but the less cutting the less hæmorrhage. Pulling as you do on the gland you may really be dissecting it off the internal jugular vein; but the latter is not visible until after the group is removed, when by the use of retractors you will see it stripped over more or less of its length, and lying at the bottom of the cavity. After the first gland is removed proceed in search of the others; they may be under the sterno-mastoid or beyond the ends of your incision; fish for the cellular tissue beside them, your assistant's fingers from the outside assisting in the delivery, then with a dissector tear your way down to the gland surface and proceed as in the first case. In this way several glands may be removed through a small wound in every direction radiating from it, even though they be deep under the sterno-mastoid, and the process of removal can be described rather as a "shelling out" than that of a dissection. In the subclavian triangle the cellular tissue is much looser, and by pulling on it, you can dissect out and deliver glands which were not apparent to the touch before the incision was made, so deeply were they hidden under the clavicle or lay in the upper part of the posterior mediastinum. No important vessel or structure is recognised during the operation; except the special accessory nerve which is occasionally exposed, and is then to be held aside by the retractor hooks; a twitch of the shoulder will betray its presence if it be in the neighbourhood of the dissector's point.

All cases are not straightforward, some are complicated with glands on the point of bursting through the skin, some with sinuses leading down

to caseous gland-substance, some with a peri adenitis round certain of the glands that make the shelling out more difficult.

During the process of removal one may have the misfortune to burst a caseous gland, spilling the contents into the wound; this, if irrigated out of the cavity, will not interfere with healing by first intention, and the wound, like the others, can be closed by a continuous horse-hair suture. Only in those wounds through which one has had to deal with a suppurating gland discharging through sinuses need drainage be allowed for. There is in ordinary cases no necessity to dust iodoform into the wound.

In numerous cases I have removed from 12 to 24 glands by these incisions, and this dissection without tying a single vessel, as the small ones near the skin are closed by the forci-pressure applied during the operation. It is useful at times to make an incision along a transverse crease in the skin of the neck, rather than make it vertical. To be able to make the incisions as small as possible is important as it does away with much of the resulting disfigurement.

A PLEA FOR TOTAL EXTIRPATION OF THE PENIS IN CANCER OF THAT ORGAN IN NATIVES.

By G. T. BIRDWOOD, M.A., M.D., CANTAB.,

CAPTAIN, I.M.S.,

Civil Surgeon Agra.

THERE have recently been six cases of cancer of the penis in the wards of the Thomason Hospital, three of which were treated by the operation of partial amputation, and three by total extirpation by Gould's method slightly modified. These figures are are not large to draw conclusions from, but the cases coming in within a short time of one another led to a comparison of their treatment, and the following remarks are made with the hope that others may be led to give total extirpation a more extended trial. It seems a very suitable operation for the natives of India for the following reasons :—

(1) The Native micturates in a sitting-down position. Partial amputation gives him a useless stump from which urine generally dribbles away over the scrotum producing often a dirty and eczematous condition. Total extirpation gives a clean servicable opening for micturition in the perineum which he has no difficulty in keeping clean.

(2) In total extirpation there is much more certainty of removing all the disease. This point has more force in dealing with natives than with Europeans. In most parts of India, away from the Presidency towns, the native will let weeks go on before he seeks advice. Generally the disease is far advanced when he comes to Hospital. The penis is either half eaten away or there is a large fungating mass. Warnings on the importance of early treatment of the 'precancerous stage' and of the danger of letting it go on to further trouble do not appeal to him. If partial amputation at this stage was recommended to him, he would not probably consent. Moreover in cancer of the penis owing to the vascularity of the organ, early distribution takes place and scattered nodules are often found early in the corpora cavernosa. So that total extirpation on this ground would be advisable in Natives.

(3.) Thirdly, the Native of India seems to stand the operation very well. No shock accompanies the operation and there is next to no hæmorrhage. One of my cases was a very old man, much emaciated and over 65, and I operated because he was in such pain and misery. The operation took thirty-five minutes. No shock followed and he made an excellent recovery. There is a general impression conveyed by the text books that total extirpation is a major operation of some severity. Jacobson speaks of it as a severe one, and Rose and Careless as a serious proceeding. Certainly before being sewn up the wound is large and gaping, but when brought together it is not more than six inches long. The dangers of a large gaping wound, if the antiseptic precautions have been thorough, are not to be feared. As regards hæmorrhage, if the corpora cavernosa are wounded, it will be considerable; but by keeping close to the bone in separating the crura there is no reason why this should occur otherwise there is no place in the operation, when the arteries can not be immediately controlled. As regards technique, separation of the crura from the bone may be a little tedious but no really formidable difficulties are met with.

Briefly, the steps of the operation, as I have performed it, are as follows :—After the usual antiseptic precautions have been taken, a silver catheter is passed down to the neck of the bladder and held firmly in the middle line. An incision about 6 inches long is made from the base of the penis to within half an inch of the anus, immediately along the raphe. Splitting the scrotum in half it is carried down till the corpus spongiosum is recognized. Then, with a few touches of the knife on each side, about a quarter of an inch from the middle line, this body is more clearly defined. A director is now forced between the corpus spongiosum and the corpora cavernosa and the separation is carried a little upwards and downwards. The catheter is now removed. A double stout silk ligature is then passed behind the corpus spongiosum and this body is tied and divided between the ligatures. This procedure stops any bleeding and facilitates the dissection of the proximal portion down to the triangular ligament, which dissection is now carried out. The next step is to free the middle portion of the corpora cavernosa from the tissues in which they

lie and carry the separation down to where the crura are firmly adherent to the bone. The corpora cavernosa shell out easily from their adjacent tissues, but the separation of the crura from the bone is a different matter. I have found that this can most easily be done by the point of a very sharp knife, making firm short strokes and keeping very close to the bone. It is a long and difficult work to separate them with a respirator. Unless the corpora cavernosa are wounded no hæmorrhage is met with till the inner border of each crus is reached, where the artery to the corpus cavernosum of that side is cut, when it can immediately be caught in forceps. Having separated the crura on both sides they are raised and the suspensory ligament divided. The skin incision is now continued at its upper end in an elliptical manner round the base of the penis when the dorsal artery is cut and secured. The whole penis can now be removed. The sides of the large gaping wound come together easily and are joined by a continuous or interrupted suture, to within half an inch of the lower angle. The proximal end of the urethra in the corpus spongiosum is now split and sutured to each side of the wound in the lower angle. No drainage tube is used. If the glands are enlarged, they must be dealt with before sewing up the wound. They are easily exposed by carrying incisions to the right or left from the elliptical incision round the base of the penis.

The operation as I have described it, differs in one or two points from that of the text books. (1) The skin incision is done in two stages. First central portion, subsequently (after the separation of the crura from the bone) an elliptical portion. By this method the dorsal artery is more easily dealt with towards the end of operation and the growth (probably a foul and septic one) is kept well away towards the abdomen, away from the large gaping wound, during the greater part of the operation. (2) The passing of two ligatures round the corpus spongiosum and cutting it between them greatly facilitates the dissection of the proximal end down to the triangular ligament. (3) The crura are separated from the bone with the point of the knife, with short strong firm cuts. This is a quicker process than using the respirator and there is no danger from hæmorrhage if the knife is kept close to the bones.

There is no doubt that partial amputation may be advisable in the very early stages but a native will seldom consent at this time to operative interference. In any other stage total extirpation seems to me to be the more preferable operation. It gives no shock, no hæmorrhages to speak of, is not difficult to perform, gives a clean serviceable opening in the perineum, is more radical and thorough in its nature (which is one of the aims of modern surgery) and tends to give the patient many more years of life, and freedom from suffering.

A CASE OF MYXŒDEMA.

By P. S. RAMACHANDNIR,

Hospital Assistant.

Name	...	Gulam Hussain.
Age	...	40.
Occupation	...	Sepoy.
Residence	...	Mysore.
Admitted into the Victoria Hospital, Bangalore	...	On 1st February.

Previous History.—About ten months ago he felt pain at both the knee-joints, but without swelling. Gradually the pain extended downwards to the ankle joints. Did not suffer from syphilis. Had been in active service, but owing to his present complaint was discharged from Military service.

Present illness.—About three months ago he noticed swelling of the legs, which gradually extended to the whole body. His speech became thick, and he found his memory getting weaker.

State on admission.—Has a peculiar complexion, thick speech, and slow in movements. The whole body appears as if swollen. Hairs not affected. Bowels regular. Appetite good. All organs healthy. Sleeps with a very heavy snore. Urine flows freely. Sp. Gr. 1002—acid in reaction; no albumin; no sugar, no casts; no ova in stools; no parasites in blood. The case was in charge of an Assistant Surgeon, who took it to be a case of Bright's Disease, and put him on "Potassii Iodid." mixture for a few days, then on "hepatic mixture." Found no improvement.

Proper diagnosis and treatment.—On 7th March 1904, *i.e.*, nearly a month after, it was diagnosed to be a case of Myxœdema and Thyroid Tabloids, grains v, twice a day were ordered. His weight that day was 172 lbs; on 14th March 1904, it was 157 lbs., and on 23rd March 1904, 143 lbs., when he took his discharge.

Recurrence.—The patient again sought admission on 3rd July 1904 for the same complaint. He weighed 157 lbs. on that day. He was put on the same treatment. On 14th July 1904, weighed 144 lbs., when he was discharged with a supply of Thyroid Tabloids.

Remarks.—I report this case as cases of Myxœdema are rare amongst men, and as also they may be mistaken for Bright's Disease with an unaccountable absence of albumin. The patient lost 29 lbs. in two weeks under Thyroid Tabloids, and 13 lbs in eleven days when he was admitted for the second time, though he was under a liberal diet during the course of treatment. Swelling disappeared, memory improved, no snoring during sleep. In fact, he went quite well.

[This is an interesting case. We do not know of any recorded cases of myxœdema in Natives of India. We saw one (doubtful) case some years ago at Bhagalpore. Can any of our readers say anything as to cases of myxœdema in Indians?—Ed., *I. M. G.*]

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INDIAN HEMP DRUGS AND INSANITY.

THE important and valuable paper which we publish from the pen of Captain G. F. W. Ewens, I.M.S., M.D., the Superintendent of the Central Lunatic Asylum, Lahore, raises again the question which ten years ago was very much debated among medical men in India.

It will be observed that, as a result of his experience while in charge of the large asylum at Lahore, Capt. Ewens is of opinion (1) that there is a form of mental disease which seems to have a direct relation to the excessive use of hemp drugs, as "a definite effect following a definite cause;" (2) it has a "definite train of symptoms of a fairly regular character."

Those of us who were in India ten years ago will remember the Report of the Indian Hemp Drugs Commission.

The seven large volumes in which the work of this Commission is recorded contain practically all that is known on the subject of the hemp drugs.

To medical men a most interesting part of this report was the analysis of the evidence on which the asylum statistics connecting insanity with the use or abuse of hemp drugs was founded. It will be admitted that these asylum statistics were proved to be utterly unreliable, as the majority of Superintendents confessed that they accepted the statements as to causation given on the descriptive rolls sent with the lunatics. That these entries, made by some police subordinate, were frequently quite misleading and quite unreliable will hardly be gainsaid. The Commission, therefore, rejected the evidence of the recorded statistics and examined for themselves the papers of 222 cases attributed to the use of these drugs. These 222 cases were out of a total of 1344 lunatics admitted to all asylums in India in the year 1892, and of these 222 the Commission could only accept 98 cases (or 7·3 per cent. of all lunatics admitted that year) "in which hemp drugs may be reasonably regarded as a factor in causing insanity."

As regards a special form of mania, the only point which could be established by the evidence before the Commission was the shorter duration of cases attributed to this drug as a cause. The Commission (*Report, Vol.* I, p. 249) wrote as follows—"Summing up the evidence as to the presence of pathognomic symptoms, in cases of hemp drug insanity, the Commission consider that, with the exception perhaps of the shorter duration of such cases when compared with cases of ordinary mania, there are no symptoms by which the cause of the mental condition can be determined. The determination of cause depends wholly upon history."

The Commission (page 263, Vol. I) also sum up their conclusions regarding the effects attributed to hemp drugs. We may briefly mention some of them here :—

(1) It has been clearly established that the occasional use of hemp, in moderate doses, may be beneficial, but such use is only medicinal in character.

(2) The moderate use of hemp drugs is practically attended by no evil physical effects.

(3) The excessive use does cause injury, tends to weaken the constitution and render the consumer more susceptible to disease, possibly dysentery and bronchitis.

(4) As to the alleged mental effects moderate use produces no injurious effects on the mind, except in cases of marked neurotic diathesis.

(5) It is otherwise with excessive use. "Excessive use indicates and intensifies mental instability. It tends to weaken the mind. It may even lead to insanity, especially, in cases where there is any weakness or hereditary predisposition."

The subject has also been ably discussed by Lt.-Col. J. H. Tull Walsh, I.M.S., in a paper published in the *Journal of Mental Science*, January 1894.* He formulates the following conclusions :—

"1. That hemp drugs are very largely used in Bengal, smoked as *ganja*, or *charas*, drunk as *bhang* or *siddhi* or eaten as *majun*. The smoking of *charas*, and the eating of *majun* are not very common.

2. Among healthy persons *ganja* smoked alone with tobacco or with a very small addition of datura (two or three seeds) produces a condition varying from mild exhilaration to marked

* We quote from Gibbon's *Medical Jurisprudence for India*, the only one of the three recent books on Medical Jurisprudence in India which fully discusses this aspect of the question.

intoxication. The violent intoxicant effects are less marked, or not seen at all, in persons having a regular and wholesome supply of food. Much the same may be said of *bhang*.

3. Among persons of weak mind, or with a marked neurotic tendency, even a moderate quantity, or only a slight excess of hemp drugs may so increase the insanity, evident or latent, as to make such persons violent, morose or melancholy, according to the neuropathy with which we start. The presence of adulterations, such as datura will increase these effects.

4. Abuse of hemp drugs, especially wher adulterated with datura, will produce even in healthy persons a very violent intoxication simulating mania, or may lead to a morose melancholic condition or to dementia. These conditions are generally of short duration and the patient ultimately recovers. So common is absolute recovery that I think when a patient confined in an asylum for the treatment of insanity said to be due to an abuse of hemp drugs does not recover within ten months these drugs were possibly only the exciting cause, and that we are dealing with an individual who was either insane previous to his use of intoxicating drugs or with one in whom latent insanity has been roused into activity by the vitiating effects of excess of *ganja, bhang*, &c."

We have referred to these echoes from a byegone controversy in order to enable our readers more easily to follow the able paper by Capt. Ewens, which we publish in this issue.

"THE MALARIAL CACHEXIA OF INDIA."

Under the above title, Lieut. Christophers, I.M.S., refers to those cases well known in India as "malarial cachexia," a term used in official returns in India, because it is the term used by no less an authority than the Royal College of Physicians, in the volume known as the *Nomenclature of Disease*.

As a matter of fact it is just now extremely difficult to give a satisfactory name to this well-recognised condition, "cachexial fever," "tropical splenomegaly," are among the names which have been used, and if, as is expected, Rogers' discovery that the Leishman-Donovan bodies are stages in the development of a trypanosome is confirmed it will become necessary to revise the nomenclature of this disease, as well as sleeping-sickness and relapsing fever, as these all seem to be forms of trypanosome infection, in fact the trypanosome bids fair to usurp the place in tropical pathology once occupied by the malaria parasite.

Therefore, for the present we may well be content with the term used by Christophers, and refer to cases of infection by the Donovan bodies as the "malarial cachexia of India."

Now in the first place this assumes that *all* cases which we used to call malarial cachexia really belong to the newly discovered infection, but is it a fact that there is no such thing as a cachexia resulting from long continued or from neglected attacks of malarial fever? This is a question to which we would like to have an authoritative answer. Again we all admit that it is but rarely that a patient dies of an acute attack of malarial fever, except of course the pernicious forms, such as the old "Peshawur fever" or such like, if then this is so, what of the thousands of deaths attributed in our sanitary returns to "fever," which is usually loosely assumed to mean malaria. Such thoughts give us pause, and should make us consider to what extent mosquito-borne primary malaria is responsible for the death-rates in India.

With these preliminary remarks we may now proceed to some consideration of Lieut Christophers' new Report on the parasite.* We strongly commend this report to the attention of our readers, it gives an admirable account of the clinical and *post-mortem* evidences of this disease and discusses its connection with "oriental sore," to give perhaps the best name to what our author calls "tropical ulcer."

In fact Lieut. Christophers classifies the infections of this parasite as two, *viz.*, a local lesion, tropical ulcer, and a septicæmia—the so called malarial cachexia of India.

To our mind one of the important results of these recent discoveries is the fact that they will help to throw light upon the problem of "chronic dysentery," especially of the low gangrenous forms. Some years ago the present writer wrote a paper on what he called "terminal dysentery," that is a sort of low gangrenous sloughing ulceration of the large intestine which not uncommonly supervenes shortly before death in cases worn out by disease in India, and especially in cases which used then to be called "malarial cachexia." It was there pointed out that gangrenous dysentery was very analogous

* Scientific Memoirs, No 11. Price Rs. 2.

to noma or cancrum oris. This being the case it would seem as if in the immediate future such cases should be more correctly attributed to infection by the Leishman-Donovan bodies, for, as Christophers writes, "noma and perforation of the large intestine would indeed appear from our cases to be the chief causes of death in infection by the parasite."

We commend this second report to our readers and especially to those who may have to deal with cases of gangrenous or sloughing dysentery, as an examination of such cases would, we believe, lead to valuable results.

LONDON LETTER.

MEDICAL EDUCATION.

THE approach of the winter session is heralded by the distribution of pamphlets by the hospitals and schools and the publication of "Educational Numbers" by the principal medical journals. These latter supply a most useful and elaborate account of the facilities, conditions and regulations affecting entry into the medical profession, and point out the physical, intellectual, scientific and moral qualifications and qualities necessary for and mostly displayed by its practitioners. The very advertisements in these special numbers are a mine of useful information regarding universities and schools, post-graduate study, clinical instruction, books and appliances. The Educational number of the *British Medical Journal* can hardly be called entertaining reading, and is perhaps more useful for reference than perusal, but it furnishes a very complete and comprehensive view of the institutions which have been established in this kingdom for medical education and study, and the means by which medical knowledge and skill necessary for medical practice may be obtained. The opening articles on "the profession of medicine," "the portals and prospects of the profession" and "the medical curriculum" are wisely and well written. The cost in time and money of preparing for the profession is frankly stated and the hardships of the calling are not concealed, but the high objects and exalted satisfactions of the ministry of health are also extolled. There is certainly in this country no lack of organizations for supplying degrees and diplomas and imparting knowledge, general or special. England has seven universities and three corporations, Scotland, four universities and three corporations, and Ireland, two universities and three corporations from which qualifications may be obtained, and the number of medical colleges and schools in the kingdom is large. There is, therefore, abundant, perhaps superabundant, supply to meet demand, and embarrassment must often be experienced in selecting. Full details are supplied regarding the courses of instruction pursued in each of these seminaries—as compared with the past the prominence of practical courses is remarkable—and of special teaching for special diplomas in state medicine and tropical diseases. The scientific and professional advance of the dental branch is also noteworthy. Some information is also given about foreign and colonial schools; but there is no mention of medical education in India, which seems a strange omission. The work of the schools will start early in October, and the usual floods of introductory eloquence will then be outpoured.

THE CAMBRIDGE DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.

The first examination for this diploma has been held, and eight gentlemen have satisfied the examiners of their competence to receive it. The examination seems to have been of a searching character. There were three written papers—in medicine and surgery, in hygiene and sanitation, and in pathology, including parasitology and bacteriology. Oral and practical examinations were also held in the Cambridge Laboratory and a clinical examination in the Seamen's Hospital, Albert Docks, London. The examiners were Sir Patrick Manson, Major Ronald Ross and Dr. Nuttall whose names are a guarantee of sound and thorough testing. This proceeding stamps the high position which tropical medicine has in recent years attained. In a leading article on "piroplasmosis," the *Lancet* of last week extolled the scientific capacity and industry of tropical practitioners, and there can be no doubt that in no section of the great field of medical research, is better and more brilliant and useful work being done than in the study of the diseases of the tropics. Among the successful candidates for the diploma was Captain J. C. B. Statham of the Royal Army Medical Corps, who has recently been appointed Pathologist to the Royal Victoria Hospital, Netley.

SEASICKNESS.

Ever and anon paragraphs appear in the medical and lay journals announcing the discovery of some new method of treating this troublesome and in some instances painful

malady. The continual recurrence of these various announcements is of itself evidence of the futility of every method of treatment which has been hitherto recommended. Ships have been constructed on the universal joint and swing principle, with a view to giving stability or comparative stability to some part of the vessel; but these efforts to abolish the sickening motion have proved vain. Probably the best hope of preventing or abolishing *mal de mer* consists in the growing practice of building of very large passenger steamers, which of course, yield less readily to the inequalities of the surface of the sea. The means of preventing or curing seasickness which have been recommended may be classed as moral, physical, dietetic and medicinal. Fighting the demon is, I am convinced from personal experience and observation, useless. To tell one not to think of it is foolish; the thing takes no denial and refuses forgetfulness or diverting occupation. Exercise, reading and conversation are perfectly inoperative as preventives. Looking steadily into a mirror was declared some time ago to be a sovereign prophylactic It was thought that the contemplation of the unmoving image would overcome the effect of the moving ship and body. This might be if the process of sickening were purely psychical; but the occurrence of sickness as a consequence of swinging and spinning on land or even in some persons by the motion of a railway train, when an upset of stomach is least expected indicates that imagination and expectation have little to do with the event. The worst attack of seasickness which I ever experienced was on the Darjeeling-Himalayan line when a large party were being run down in a trolly at a rapid rate from Ghoom to Kurseong. The swinging and swaying round the frequent curves of the line was irresistible, and I never saw such a collection of pale-faced, flabby and miserable human beings as descended from that trolly. The effect wore off very quickly, and we did ample justice to the excellent lunch provided for us by Mr. Payne, our host and pilot. Warm clothing, a tight binder, and the prone position are useful comforts, but their preventive action is very limited. Stout and hard biscuits, iced champagne and other articles of food are offered to the "squeamish" but they simply precipitate the crisis. Of course much depends on the personal element, on habituation and on the gravity of the circumstances. The best plan, I believe, when matters seem to be perilous is to give in—seek your bunk, lie on your back, put a warm rug over you, and yield to the feeling of sleep which fortunately accompanies the early stages of the upset. The latest remedy for seasickness is Validol, and Koepke declares that he has found it effective in hundreds of cases during the last three years. Fifteen drops are given on sugar when premonitory symptoms of headache, dizziness, bad taste in the mouth and salivation arise and the patient is told to lie down for half an hour. The dose is repeated if these symptoms recur, and a little wine and food may be taken occasionally after the medicine has been administered According to this writer seasickness is due to anæmia of the brain and Validol is held to raise the blood pressure and reduce the sensibility of the mucous membrane of the stomach. Fortunately seasickness does not, in most cases last very long, and after a time it may be fought with success. When the crisis is past, fresh air, and cautious feeding help materially to restore the patient. This ought to be held in mind in estimating the value of drugs. I know nothing of Validol and have never seen or taken or prescribed it, but there can apparently be no harm in making trial of it. At the same time I doubt whether in urgent and severe cases, the introduction of any material whatsoever into the stomach is wise, at any rate in the early stages of the attack.

THE SERVICE EXAMINATIONS.

These have recently been held in London. Forty-nine candidates entered for the Royal Army Medical Corps, of whom thirty were selected. Twelve of these have university degrees, four possess literary degrees, one is a D. P. H., London, and one an L. D. S., England. For the Indian Medical Service there were 33 competitors, of whom 21 held university degrees, and 13 were chosen to fill vacancies. The results of both examinations are considered satisfactory. The selected candidates of both services are now undergoing a course of instruction in hygiene, pathology and military surgery in London, and in November the Royal Army Medical Corps men will proceed to Aldershot and the Indian Medical Service come to Netley for tropical diseases, &c. The new Royal Army Medical College buildings have not as yet been commenced.

K. McL.

15th September, 1904.

Current Topics.

CANCER IN THE PUNJAB.

We have received a reprint of an article by Major David W. Sutherland, M.D., M.R.C.P., I.M.S., the Professor of Medicine in the Lahore Medical College, which is of great value, as it is an attempt, by searching the registers of the Mayo Hospital, Lahore, to gain an idea of the prevalence of malignant disease in the Punjab.

The Mayo Hospital draws its patients from all parts of the Punjab, and of 43,412 cases admitted to hospital in the twelve years 1892 to 1903, only 792 were cases of malignant disease. These are returned as follows:—Carcinoma, 400; sarcoma, 334; abdominal tumours, 35; and malignant growths, 23; that is, a total of 18 cases of malignant disease per thousand admissions to hospital. The tumours were examined to the number of 226, and 87 proved to be forms of carcinoma, and 139 were varieties of sarcoma. Of the carcinomata, 52 were epitheliomata, and 23 scirrhus. The sarcomata were of many forms, but chiefly spindle celled and fibrosarcomata. Out of 329 cases of carcinoma, where the site is mentioned, 72 were of the penis, 58 of the skin, 50 of the breast, 30 of the rectum, 23 of uterus, 23 of liver, 20 of tongue, 10 of lip, and smaller number of other parts of the body.

Of the sarcomata 112 were of head and neck, 59 of lower extremity, 26 of organs, 24 of upper extremity, 21 of the trunk. The site of the rest was not specified.

It appears from the hospital statistics that the number of cases admitted has been fairly uniform, and there has been no apparent increase within recent years.

As regards racial distribution, the Hindus and Mahomedans in Lahore District are about equal in numbers. The prevalence of malignant disease is pretty equal, except in case of cancer of the penis, which Mahomedans, owing to their practice of circumcision, very rarely suffer from. It is also noted by Major Sutherland that although a large number of Eurasians use the Mayo Hospital but few suffer from malignant disease, a far smaller number, indeed, than that of Europeans in the Punjab.

The maximum ages of prevalence for carcinoma was from 40 to 50 years, then 50 to 60, and then 30 to 40. The sarcomata appeared earlier in many cases, the maximum being for years, from 30 to 40. The sex ratio is of less value, owing to the larger number of males who resort to the hospital.

Major Sutherland's remarks on these figures may be quoted in extenso :—

"These statistics are too few to be of much value in themselves . . . but they tend to show that cancer is not a common disease in the Punjab, but such cases as occur apparently affect all classes . . . .

". . . The carcinoma statistics quoted in this paper bear out the general principle that cancer tends to occur at the sites of chronic irritation where there is constant need for cell repair. Fifty-eight cases of epithelioma and 36 of rodent ulcer occurred in the skin, which in India is almost constantly the seat of injury, owing to the scanty clothing worn by the Natives. Many of these are of the scalp. It seems possible that they are set up by irritation caused by cuts with a blunt razor, for most Mahomedans shave the head as a whole, while many Hindus shave a portion. In patients from Kashmir an epithelioma of the skin of the exterior abdominal wall is common from burns produced by small charcoal fires in earthenware vessels, which they hold against the bare skin under the long, flowing skirt in winter to keep themselves warm. The freedom of Mahomedans from cancer of the penis, and their practice of circumcision, bears upon this point.

The nature of the diet does not seem to affect the incidence of cancer in the Punjab, for although both classes are for the most part vegetarians, the Mahomedans supplement this vegetable diet with meat, while the Hindus do not, yet both equally suffer from cancer. A vegetable diet makes the digestion of the Native more intestinal than gastric, and this probably throws greater strain on the pancreas, intestines, and liver than on the stomach. It is noteworthy in this connection that abdominal cancer, in hospital practice in India, is much more common in the three former situations than in the stomach. This is probably helped by the frequent implication of these organs in tropical diseases. Alcohol also can have little relation to the disease, for Mahomedans rarely take it, while Hindus constantly indulge in various kinds of native spirits—more or less alcoholic. Syphilis, too, is equally prevalent in both classes, and is a very much more familiar disease in hospital than cancer. There is nothing in the Punjab to shew that malaria is in any sense related to cancer, for while malaria is the most common of all diseases, cancer is rare, and my own experience, in one of the most malarial regions beyond the Punjab frontier, for nearly two years, gave only four cases of cancer to 1,640 of malaria. The spleen, too, which is always affected in malaria, is hardly ever the seat of cancer, at all events in this part of India."

Dr. W. S. Lazarus Barlow, the well-known authority on cancer statistics, publishes some remarks on Major Sutherland's figures, and contrasts them with the statistics of the Middlesex Hospital (*see* Cancer Laboratory Report, Vol. I, p. 183) :—

"Of the 419 Middlesex cases two-thirds (approximately) were women, while of the Mayo cases two-thirds were men. Hence it is clear that in the case of female cancer the figures of the Mayo Hospital must be doubled in order to make a comparison. Dr. Sutherland does not indicate the sex of the individual cases in his report, but since uterine and mammary carcinoma make up about three-fourths of all cancer in women (at all events in England), valuable conclusions may be drawn.

The figures are as follows :—

	Middlesex Hospital.		Mayo Hospital.	
	Number of Cases.	Percentage of total Female Cases.	Number of Cases.	Percentage of Female Cases.
Carcinoma of Female Generative Organs	78	27·96	25	19·84
Carcinoma of Breast	131	46·95	50	39·68
Totals ...	209	74·91	75	59·52

From these figures one may fairly deduce (*a*) that in women carcinoma of the generative organs and of the breast is relatively more frequently seen at the Middlesex Hospital, and (*b*) as a corollary, that in women carcinoma of parts other than the generative organs and of the breast are relatively more frequently seen at the Mayo Hospital. The difference, too, between the actual percentages is so considerable (15·4 per cent.) that it seems probable that there is a marked difference between the districts from which each hospital draws its female patients in respect of the regions which are attacked by carcinoma. At the same time the fact that in women breast and uterus are the chief sites of carcinoma, whether one is considering a hospital in London or one in India, is clearly brought out.

How far error is introduced into the figures given above by inclusion of cases of carcinoma of the male breast in the Mayo series it is impossible to say. In the Middlesex series such cases have been carefully excluded. Probably, however, the error is not a considerable one, and even if present only leads to underestimation of the differences mentioned in the text."

The inquiry is one of great interest, and we trust that the medical officers of other large hospitals in India will follow Major Sutherland's good example and send us the results of their inquiries for publication.

THE RECENT BACTERIOLOGY OF DYSENTERY.

THE following extract from a paper by Dr. C. W. Duval, of Boston, is of value in clearing up some points in the bacteriology of this Protean disease (*Journal of A. M. A.*):—

"Until the more recent work of Martini and Lentz, the bacillus discovered by Shiga as the cause of Japanese dysentery, the bacillus isolated later by Flexner and Strong in the Philippines, Kruse in Germany, and Vedder and myself in this country were thought to be culturally identical, except for the minor inconstant differences as shown in the ordinary media then employed, which differences might be expected of individuals of the same species. Martini and Lentz, employing a mannite medium, discovered that certain of these isolations would ferment and others fail to ferment with acid production on this alcohol. Still more recent studies by workers in this country have determined other cultural differences between various isolation in their action on certain special sugars.

These cultural distinctions between the bacilli are in conformity with variations in agglutination reaction; based on these important differences, we now speak of members or strains of the dysentery group. This knowledge of types or strains of the dysentery group has led me of late to carefully test the biochemical reactions of every dysentery-like organism found in cases of acute dysentery and infantile diarrhœa, with the view of determining whether or not there are still other unrecognised members of the group.

In all probability the bacillus which I am about to describe is another member or subdivision of the dysentery group represented by the "Fermenters on Mannite."

In my paper I shall give a brief description of the case, method of isolation, morphology, cultural features and agglutination reaction of the bacillus.

The organism was isolated in large numbers from the contents and scrapings of the gut in a fatal case of dysentery occurring in an adult. The autopsy showed that the lower portion of the colon was the site of infection. A pseudomembrane was present, and the mucosa gave evidence of many small necrotic areas. The intestinal contents were semi-liquid, muco-fæcal in character, with large quantities of blood-stained mucus.

METHOD OF ISOLATION.

Scrapings from the mucosa and the blood-streaked mucus from the gut contents were suspended separately in tubes of sterile saline solution. The tubes were well shaken and set aside to allow the washed mucous flakes and solid particles to settle, which left a perceptible bacterial cloud in the upper two-thirds of the tubes. A series of twenty-four agar-gelatin plates were inoculated, using one loop of the suspension for each plate. By seeding the plates in this manner I obtained a uniform number of colonies on each plate.

The plating material used was similar to the His plate medium for typhoid, except for the leaving out of the beef extract and the addition of 1 per cent. peptone. Preparing the medium without using beef extract makes a clear and transparent plate medium, on which the superficial dysentery colonies can be readily differentiated from the colonies by the naked eye. Apart from the dysentery colony being smaller, its dull pearl-gray colour is in marked contrast to the glistening cream colour of the colon. Peptone in the plate medium is essential as a nutrient, since one of the cultural peculiarities of the dysentery colony is its frequent late appearance on the plates.

The organism isolated from this fatal case of dysentery is a fairly short bacillus, with rounded ends, ranging from 1 to 3 microns in length, often coccoid in form and occurring singly and in pairs. The bacillus stains with the anilin dyes, but all the bacilli in a preparation do not stain with equal intensity. The organism is readily decolourized by Gram's method. It is non-motile under ordinary conditions. Spores have not been noted Flagella may be demonstrated by the modified Van Ermengen method, as described by Vedder and myself.

In general, the morphology and staining reaction of the bacillus is that of *B. dysenteriæ* (Shiga). I have never been able to note constant differences in morphology and staining reaction of the various dysentery cultures. Any variation that might be noted for a given isolation is wholly unreliable from the standpoint of differentiation. Some investigators hold that the Flexner-Harris culture is less coccid than the Kruse, Shiga and New Haven cultures. Again, His and Russell state that their "Y" organism corresponds more closely to the Kruse culture than to the Flexner-Harris culture. In my opinion, one culture cannot be distinguished from another in morphologic differences. There is a wide variation in morphology, governed by the age of the culture, kind and reaction of medium, and the temperature at which the organism is growing.

CULTURAL CHARACTERISTICS.

The bacillus grows well on the ordinary culture media and corresponds on these in every respect to *B. dysenteriæ* (Shiga), with one exception—the reaction on neutral litmus milk. Like the Shiga culture, the organism produces the initial acidity in litmus milk, as indicated by the lilac colour. At forty-eight hours the milk is still acid, but it is evident that a gradual change back to the original colour of the medium has set in. After three to four days the milk regains its original blue colour, which colour remains for four to six days, when a second acid change occurs in the medium much more marked than the initial acidity. This second acid change in the milk is permanent. The tube remains always distinctly red, and at no period is there any tendency toward coagulation. In my hands none of the known cultures of the dysentery group produces this peculiar reaction in neutral litmus milk.

A study of the bacillus in litmus serum water media to which 1 per cent. mannite, dextrose, dextrin, galactose, saccharose and inulin have been added, shows a complete correspondence with the so-called "Fermenter on Mannite," as represented by the Flexner-Harris and the Baltimore summer diarrhœa cultures. All of these cultures split the mannite, dextrose, dextrin and galactose as indicated, by first a change to pink and later coagulation of the medium. The saccharose and inulin

media remain unchanged. In litmus serum water medium, to which 1 per cent. of chemically pure lactose is added, the bacillus ferments with acid production. The medium first changes to a pink colour, and later is converted into a solid coagulum.

The ability of the bacillus to split lactose, and the production of a second marked acid change in neutral litmus milk are cultural peculiarities not possessed by any of the heretofore described strains of *B. dysenteriæ*.

Agglutination Reactions.

The bacillus gave a positive agglutination reaction with the patient's blood in dilution 1/400. The Flexner-Harris culture was positive in dilution 1/200. Shiga's culture did not react in any dilution. *B. typhosus* was positive in dilution 1/80. Paratyphoid cultures were uniformly negative.

The bacillus of typhoid reacting with the patient's blood led me to test my organism with the blood of patients suffering from typhoid fever, since this case was clinically dysentery, with no previous history of typhoid. Again the autopsy showed no evidence of typhoid lesions, and the plates were free from colonies of typhoid bacilli.

The blood of fifteen cases of typhoid fever were tested; in each case the typhoid bacillus reacted in dilutions not less than 1/80, and in a number as high as 1/2,000.

In every case my bacillus was agglutinated with the typhoid serum. In many of the cases clumping occurred in as high dilution as with the typhoid bacilli. For example the blood of a typhoid patient in the third week of the disease gave a positive reaction for the typhoid, and my organism in dilution 1/2,000. Shiga's and Flexner's cultures were negative 1/25.

In but two of the fifteen bloods did the Flexner-Harris culture give a positive reaction, and then only in relatively low dilution.

The organism, when tested with the antidysenteric serum from a horse immunized against the Harris strain of *B. dysenteriæ*, reacted in fairly high dilution, but not so high as the immunizing bacillus.

Rabbits immunized against *B. typhosus* and my organism produce common agglutinins for both cultures. The blood of a rabbit immunized against the Flexner-Harris organism was positive to my bacillus, but negative to *B. typhosus*.

Resume.

I have in this paper given a brief description of a bacillus in all probability another member of the *B. dysenteræ group*. The organism differs from all hitherto described strains of the dysentery group, in its action on lactose and litmus milk. These distinctions in cultural features are in conformity with the variations in agglutination reaction. The bacillus is identical in morphology and in its action on mannite, dextrose, dextrin and the more common culture media with the Flexner-Harris strain of *B. dysenteriæ* The bacillus is agglutinated in high dilution with the blood of typhoid fever patients, also with the blood of rabbits immunized against typhoid. Likewise, *B. typhosus* is agglutinated with the blood of rabbits immunized to this organism. The production of common agglutinins shows a close relationship between this organism and the typhoid bacillus. Though this bacillus possesses properties in common with the typhoid bacillus, it has, however, more in common with the dysentery. Therefore, in my opinion, it is rightly considered another member of the dysentery group.

THE GOVERNMENT MATERNITY HOSPITAL, MADRAS.

The report of this institution is always of interest. There was a total of 3,727 cases treated in the hospital throughout the year. Out of 2,000 cases 1,406 were cases of natural birth, and of these 1,398 were born with occipito-anterior presentations, four with posterior, one brow and three face. Of 142 difficult births, ten were tedious over 24 hours, and 132 were laborious, forceps being used in 103. Out of 46 preternatural births, 37 were inverted, 5 were transverse and 4 compound. Out of 2,000 cases, there were only 33 plural births; one only being triplets, 32 twins. The percentage of primiparæ treated was 30·7. There was a monthly average of 166 deliveries. Of the 2,000 births—

70 per cent. were natural labour.
7·1 „ „ difficult „
2·3 „ „ preternatural labour.
15·9 „ „ complicated „
4·35 „ „ abortions.

In cases of natural labour the average duration of labour was in primiparæ 11·7 hours, in multiparæ 8·5 hours.

There were 104 cases of sapræmia or septicæmia, of which eleven died. It is noted that 54 of these cases came from the "caste wards," and such women are usually examined outside by ignorant and dirty barber-midwifes.

Out of 1,779 live children born there were only fourteen cases of ophthalmia neonatorum and eleven of these were "slight cases."

There were 67 abdominal sections done, of which 57 were cured and twelve died. There were also done 74 operations on the uterus, fourteen on the tissues adjoining the uterus, 65 plastic operations, eight operations about the vulva, and five general operations.

There were 21 cancer cases treated in the hospital, *viz.*, one European, four Eurasians, the rest Natives. Of these 19 were carcinoma of the cervix, fifteen of which were inoperable, and two of the vagina. Of the 17 cases of cancer seen at the Egmore Dispensary all were inoperable.

This report is an excellent record of good work done and reflects great credit on Lieutenant-Colonel A. J. Sturmer, I.M.S., the Superintendent, and his staff. It is very desirable that the statistics of such an institution as this should be tabulated for ten years, it would then show clearly the average incidence of the various incidents and complications.

THE ROTUNDA HOSPITAL, DUBLIN.

We have received a circular on the advantages of this celebrated Hospital, "the largest, the oldest and most famous gynæcological and maternity hospital in the British Empire." That this claim is not without foundation is clear when it is mentioned that over 2,000 maternity cases are admitted to the wards every year, over 2,700 are attended by the students in their own homes, and over 14,000 patients attend the Out-patient Department, and over

SOME COMPARATIVE STATISTICS.

We quote the following Statistics from the five Sanitary Reports at present to hand ; some of the contrasts in figures are sufficiently remarkable :—

Province.	Population.	Ratio of births per mille in 1903.			Birth-rate for 5 previous years.	Deaths per mille of Population from, (in 1903).							
	(Census 1901.)	m.	f.	Total.		Cholera.	Small-pox.	Plague.	Fevers.	Dysentery and diarrhœa.	Respiratory diseases.	All causes.	Mean ratio deaths per mille for 5 previous yrs.
Bengal ...	74,428,193	20·0	19·9	**39·0**	38·1	2·73	·40	·88	22·2	·76	·10	**33·3**	**30·9**
Punjab ...	20,108,690	22·5	20·4	**42·9**	40·7	·7	·80	10·2	25·3	·80	3·4	**49·0**	**36·7**
Assam ...	5,275,706	18·3	17·2	**35·5**	32·9	1·5	·21	·01	14·2	1·9	·08	**26·5**	**30·1**
U. P. ...	44,301,527	23·9	22·2	**46·13**	42·6	·99	·46	1·77	27·6	·87	·50	**40·2**	**30·9**
Madras ...	34,074,735	15·9	15·3	**31·2**	28·4	·70	·40	·2	8·8	1·1	·30	**21·5**	**20 4**

400 operations are done annually. There are daily clinical lectures and special classes, and a new Pathological Laboratory has been opened. The hospital offers exceptional advantages to men at home on furlough who wish to do post-graduate work, and from a personal experience we can strongly recommend it. A three months' course costs 12 guineas and shorter or longer courses in proportion. Excellent lodging and board can be got in the house at the low rate of 25 shillings a week. A fee of six guineas opens the practice of the hospital to night students. Further particulars are obtainable from Dr. E. Hastings Tweedy, the Master.

Lieutenant-Colonel H. K. Allport, R.A.M.C., has published an interesting note on a new experiment in conservancy (*Journal, R. A. M. C.*). In a seven-seated latrine, instead of dry earth he put in each pan 24 oz. of perchloride lotion (1 in 4,000). The pans were cleaned twice a day and the solution renewed. The results are said to be excellent, "flies disappeared, there was no perceptible smell, and no dust"..... "The undoubted deoderant property of dry earth must be set aside, we allow ourselves to be blinded to the real danger [*i.e.*, infected dust —Ed.] "nitrification that may take place in the earth outside does not prevent infection in barracks." The cost of course is slightly more—eight annas a month per latrine of seven seats is not much. This "wet system" is probably worth a trial, *e.g.*, in Jail Hospitals or other hospital latrines.

Lieutenant-Colonel C. G. D. Mosse, R A.M.C., gives an interesting account of an outbreak of true beri-beri among the Boer prisoners of war at St. Helena. There were 90 cases, ten of which were fatal. All varieties of the disease were present. The camp was 1,700 feet above sea-level and several miles from the Civil Hospital where occasional cases have been treated, having been landed from ships, chiefly Norwegian. Lieutenant-Colonel Mosse inclined to the view that the Boers brought the infection with them, and the disease has been recognised in South Africa, but rarely, at Durban and Pietermaritzburg; it is however said to be common in Mashonaland (Clemow, *Geography of Disease*).

The returns of the Health Officer of Bombay show that a few cases of relapsing fever are constantly reported. In view of the discovery that the spirillum is a trypanosome these cases afford an opportunity of studying this question which, we hope, will not be overlooked.

We direct the attention of our readers to the letter from the Sanitary Commissioner, Madras, in which he clearly states the position of the useful class of officers known in Madras as certified Sanitary Inspectors, and clearly disposes of the ludicrous, if not malicious, statement about them which appeared in a new publication in Madras, and which we gave unnecessary circulation to by noticing in our September issue.

In the September *Journal R. A. M. C.* Lieutenant-Colonel F. J. Lamkin has a useful article on his method of treating syphilis by the intramuscular method, in the form of metallic mercury (Lang's cream). In 10,000 injections he had only one abscess.

A correspondent writes to a recent number of the *Lancet* that the nasty "*post-mortem* smell," which clings to the hands after the performance of an autopsy, can easily and completely be removed by rubbing some chloroform on the hands. This is a hint worth remembering.

At the Sanitary Congress at Glasgow an interesting paper was read by Provost Shanks, of Barrhead on "six years experience of the septic tank sewage disposal system" in which he expresses himself much pleased at the results; when capital is repaid the "sewage of the town will be purified at quite a nominal cost," about a halfpenny in the pound per annum.

The effluent we read "has been good enough for our requirements, being cleaner than the stream into which it was discharged." It was always in appearance like clean water, and absolutely without smell.

In an article in the *Medical News* Koplik strongly advocates the use of lumbar puncture as a means of treatment in cases of cerebro-spinal fever. Seger reports nine cases in twenty fatal after treatment by lumbar puncture, or 45 per cent., compared with 60 per cent. under other treatment.

Reviews.

Legal Medicine (in India) and Toxicology.—By Major Collis Barry, I.M.S., F.I.C., Chemical Analyser to Government of Bombay, &c. Illustrated by plates; 2 vols. Second Edition. Thacker & Co., Ltd., Bombay, 1904.

It is a proof of the excellence of Major Collis Barry's book on Legal Medicine that a second edition has been called for within 18 months of the appearance of the first. At the time of the publication of the first volume we expressed our appreciation of this work and recommended it to our readers. The author in bringing out the second edition has had the opportunity of considerably revising and making additions, which bring the subject matter up to date, especially we may note the test by which human blood may be distinguished from that of other mammalian animals. Major Collis Barry concludes that the "precipitin" test fails under the following conditions—(*a*) "in the case of blood stains which have undergone considerable exposure to heat, as in some bloodstains dried in the tropics; (*b*) stains which have been subject to the chemical action of alkalies, acids, and certain salts, *e.g.*, corrosive sublimate, ferrous and cupric sulphates, tannin, unslaked lime, formalin, thymol, lysol, lysoform and some other antiseptics." Moreover, the test has been shown to react with old stains dried in some cases as long as 58 years. On another point the new edition contains an up-to-date statement of our knowedge, *viz.*, on snake poisoning, in the preparation of which the author had the aid of Capt. G. Lamb, I.M.S, a well-known authority. He concludes that" "Everything points to a practically specific action of each antivenene for its own particular venom and for no other."

Before passing on to the second volume, a word of praise must be given to the very excellent illustrated plates of dhatura, strychnos, cerbera thevetia, jatropha or physic nut, semecarpus or *bhela*, plumbago or *chitra*, &c.; these are reproduced from plates lent by Lt.-Col. Kirtikar, I.M.S.

The distinguishing characteristic, in our opinion, of this work on Legal Medicine is the second volume. It is a matter of opinion whether illustrative cases should or should not be incorporated in the text, but there can be no doubt of the value, interest and importance of Major Collis Barry's second volume. The volume contains a large number of illustrative cases, which are referred to in the footnotes of Vol. I. The cases have been collected from a large number of sources and though no attempt has, of course, been made to include all recorded cases, yet the reader will, we think, agree with us that the collection here given is of great value and will illustrate any question which may arise in a court of law. This volume is therefore of special value to lawyers and pleaders, as well as to medical men. Suppose one has to deal with a question of legitimacy or paternity, one can turn to Chapter X of this second volume and find references and details of thirteen such cases. Take the question of live-birth—no less than 48 cases bearing on this point are quoted. Take injuries—we find 66 cases of injuries to organs in the thorax, 146 cases of abdominal injury—spleen, liver, uterus etc. etc., 37 cases of gunshot injury, 55 cases of starvation, nearly 300 cases of hanging, strangulation and suffocation, 100 cases of drowning, 140 cases of infanticide, 123 cases of rape, 34 cases involving divorce, 20 cases of the determination of age and an admirable table on the limits of normal vision, etc., etc. Section II of the second volume consists of some 200 pages devoted to poisoning by corrosives, metallic poisons, vegetable poisons and drugs of all kinds. In each case the sex, age, doses, result, reference to publication, and remarks are given. It is a marvellously complete synopsis of the subject and adds greatly to the value of this volume.

We have not alluded to half the subject illustrated in the volume, but the reader is assured that he will seldom consult it in vain, and, indeed, we are of opinion that Major Collis Barry's work is worthy of possession even for the second volume alone.

Tuberculosis and Acute General Miliary Tuberculosis.—By Professor Cornet of Berlin. Edited by W. B. James of Columbia University, New York. (Nothnagel's Encyclopædia.) W. B. Saunders & Co., 1904.

It is difficult to describe this great work without using superlatives. It is very big, very well printed, on very good paper, and it contains an exhaustive and very complete account of the great subject of Tuberculosis, and is a monument of industry and knowledge.

We can only attempt to indicate to our readers something of the vast amount of information on this most important of diseases, which is contained in the volume before us. It commences with a brief historical survey of the disease from the days of Celsus and Galen to

those of Robert Koch. The second chapter deals very fully with the tubercle bacillus, its morphology, biology and chemistry, and its occurrence outside the body.

The vexed question of the relation of animal to human tuberculosis is discussed, and we note that, while Prof. Cornet merely admits the danger from tuberculous milk or meat, the American Editor much more strongly insists upon the necessity for not relaxing our efforts to prevent the use of tuberculous meat and milk; while admitting that "by far the most important source of infection for human beings is the tuberculous individual himself, and especially he in whom the destructive process has localised itself in the lungs." The remaining chapters of Part I deal with the histology of the tubercle, the modes of invasion of the bacillus, infection, heredity, and predisposition.

Part II is devoted to pulmonary tuberculosis, symptoms, courses, terminations, types, diagnosis, complications, prognosis, prophylaxis and treatment. The twenty-eight pages devoted to prophylaxis, private and State, are most important and interesting. On page 519 of the volume we find the following remark (after stating that tuberculosis is "the most general disease of mankind" and that it kills one-seventh of all peoples)—"never before, as far as figures show, did the mortality from tuberculosis fall so low as it is to-day." It has now fallen to about two-thirds of what it previously was. The resistless force of the figures quoted, says our author, *demonstrate the correctness of the premises, the practicability and the success of the antibacillary prophylaxis of the past, and make it incumbent upon both the individual and the State to institute further measures.* (The italics are those of our author.)

The chapters on the therapy of pulmonary tuberculosis are very valuable and contain a vast amount of information about method of drug treatment and on feeding and open-air treatment; "*one of the fundamental requirements* (writes our author, again in italics) of phthisiotherapy, therefore is the free enjoyment of pure air and this must be satisfied to the full if the best results are to be obtained," the temperature of the air *not* being a matter on the whole of great importance.

No less than 623 pages are devoted to tuberculosis; after this we find 60 pages more given to acute miliary turberculosis, and the volume ends with a good index and a very complete bibliography of the disease, which extends to over 90 pages.

It is truly a monumental work, and should be in the library of all interested in this most important disease.

The Pocket Companion of the British Pharmacopœia.—By PETER WYALL SQUIRE. Messrs. J. & A. Churchill, London, 1904.

THIS is a new book, built partly on the lines of the old Squire's Companion, which has been a very old friend to practitioners for many years. It compares the strength of its various preparations with those of the United States and other foreign pharmacopœias, to which are added non-official preparations and practical hints on prescribing.

It is practically the only book of the kind that contains all the official substances arranged in alphabetcal order, the few exceptions to this rule are easily got at by reference to a most excellent and exhaustive index. Those non-official substances which have not fulfilled the anticipations expected of them are just mentioned in small print under the substance to which they are most closely related.

The "Prescribing Notes," which formed one of the features of the old Companion have been largely increasd, a great mass of experimental work having been undertaken and carried out to make these notes on prescribing as practical and as accurate as possible.

This new Companion gives all the necessary information required in the ordinary course of prescribing and dispensing of medicines; such information, for instance, as the physical characters of salts, their solubilities and doses, more particularly those of recent introduction, and the best method of prescribing them.

For the purposes of comparison, the Pocket Companion gives under potent drugs, the British Pharmacopœia dose and its equivalent under the metric system, together with the dose of the drug given in foreign Pharmacopœias.

The chapter on therapeutic agents of microbial origin, specially written for the book by Dr. Tanner Hewlett, is specially valuable and gives a very clear account of the present position of this important department of the treatment of disease.

There is a chapter on mineral waters and spas included, giving the quantities of the principal ingredients of each spring. We notice the author only claims eight spas for England.

The Posological Index we consider has been rightly dispensed with, as it is really not necessary in a book arranged alphabetically and with a good index.

We have no hesitation in saying that this new companion is the most reliable and generally useful of its kind at present on the market, and it will assuredly be found to be a ready help to the physician.

It contains a wonderful amount of information within its 766 pages, every thing of importance being very fully and accurately dealt with.

The book itself is extremely well produced, being well bound in red morocco and well printed on good paper, and altogether we may congratulate the publishers on the way they have done their work.

The only criticism we care to make is in regard to its title "Pocket Companion." Of course, it all depends on the size of the pocket, but in our opinion a more ambitious title for the book

would have been justified. We have the greatest pleasure in recommending this Companion to the profession as a sound, accurate and concise guide to all the present-day knowledge of drugs and their exhibition.

The Meaning of a Modern Hospital.—By W. BRUCE CLARKE, M.B. (Oxon.), F.R.C.S., of St. Bartholomew's Hospital. Longmans, Green & Co. 1904. Price One Shilling.

THIS little pamphlet is an amplification of a lecture delivered by Dr. Bruce Clarke at the Abernethian Society of "Barts."

The pamplet contains a good deal of information, which, however, most civil surgeons in India have had to learn for themselves. "A good hospital," says Dr. Clarke, "so far as its construction is concerned may be summed up in two words—ventilation and sunlight." He then goes on to describe the word unit. He points out that "rather less than 30 beds per ward is the most advantageous number." Floor-space is even more important than cubic air space. We are glad to see that the author recognises this, and it is certainly the fact in India with wide-open doors and windows. He gives 100 to 150 superficial feet of floor space, not too much for a ward for the sick. There should be 4 feet at least between each bed, and a central passage down the ward of from 10 to 12 feet; in fact, a ward should be 27 feet wide. A height above 13 feet is not necessary. The lavatory and water-closet should be separated from the ward by cross ventilated bridges, so that by no possibility can air enter from them to the interior of the ward. Balconies or, as we call them in India, upper verandahs, are recommended. He says that each "pavilion" may have as many as five floors, provided each individual ward is absolutely cut of from its neighbours, above and below. A good rule is that the space between any two pavilions should be about equal to $1\frac{1}{3}$ times the height of such pavilions—thus if a pavilion be 75 feet high, the distance between it and its neighbour should be not less than 90 to 100 feet. The pavilions may be built radiating like the spokes of a wheel (like several of the Central Jails in India) or in form of a hollow quadrangle with the corners left free for air circulation. Other sections of the pamphlet deal with isolation blocks, operating theatres, warming and ventilation, *post-mortem* rooms, quarters for the resident staff and for nurses, out-patient accommodation, &c. On the whole, the little book will be found worth reading by civil surgeons, who are enlarging or rebuiling their hospitals.

ANNUAL SANITARY REPORTS.

I. BENGAL.

THE Annual Sanitary Report for Bengal for the year 1903 was submitted to Government by Major Clarkson, I.M.S., the Sanitary Commissioner for Bengal. The birth rate in Bengal was 39 per mille and the death rate 33·3 per mille. The **birth rate** in the Punjab was 42; in the United Provinces 46·1, in Central Provinces 45·1. The death rate in the Punjab was no less than 49 per mille, largely owing to plague, Bombay 43·9; United Provinces 40·2; and Central Provinces 35 per mille. The death rate from all causes in Calcutta was 35·1 and in Bengal towns 36·7. Calcutta as usual maintained the unenviable notoriety of being the worst place for infant mortality, with an **infant mortality** of 33 per cent for males, and 29·9 per cent for female children. The causes acording to the Sanitary Commissioner and the Calcutta Health officer being bad midwifery, bad maternal conditions, closely packed houses and adulterated milk. In England the infantile mortality per 1,000 births in 1901 was 151, in Ireland 100, and in Bengal 194 per mille. The year 1903 was a bad **cholera** year over the greater part of the Province, the figures giving a ratio of 2·7, in fact higher than any year under record except 1900. "Which was the blackest year on record in this respect." As to the districts, Ranchi and Darjeeling suffered least, as usual, and Champaran district suffered most, cholera alone having caused over 9,500 deaths. Puri, Shahabad and Cuttack also suffered severely. In Puri the Civil Surgeon reports that cholera generally commences up the pilgrim road or on the railway, then infects Puri town and from there spreads all over the district. Disinfection of wells was often resorted to and with good reported results in several districts. Only 1,904 **inoculations** against cholera were done, a very considerable falling off from the figures of previous years. An inoculation depôt has now been established at Asansol for the benefit of labourers going to Assam. As regards results, out of 2,633 coolies not inoculated 2·5 per cent were attacked, whereas of 199 inoculated coolies, on board Assam steamers, only 2·01 per cent were attacked and only 1 died. **Plague** chiefly affected Calcutta, Chapra, (Saran District), Patna and Shahabad, Monghyr, Darbunga and Mozufferpore districts. Except for a few stray cases, the districts in the Divisions of Raghshaye, Dacca, Chittagong, Orisia and Chota Nagpore, remained practically free. Plague in Saran and Patna Di tricts was worst from February till April. **Inoculation** met with but little success, in spite of the efforts of the Civil Surgeon; in Saran 1,044 persons were inoculated and in Patna 2,504. The Magistrate of Patna considers that the history of the past five years seems to show that plague is severe in alternate years. This applies at least to Patna, but scarcely to other districts. The causes which seem to foster the disease (says the magistrate) are easy communications and the existence of grain markets, hence the prevalence of the disease along the tract of the E. I. Ry. He also reports that the people are year by year becoming more ready to adopt evacuation; he also notes that chemical disinfection is unpopular, but "disinfection by burning cowdung cakes on the floor is understood by all and carried out by many."

The Government resolution on the above report is an interesting one. It is satisfactory to see that Government agrees with the Sanitary Commissioner as to the considerable prevalence of **Tuberculosis in Bengal**, and efforts have been made to spread abroad a knowledge of this fact and of the means of preventing this fell disease. The tables prepared by order of the Lieut.-Governor show that in the last five years there has on the whole been a great and wide-spread **decrease in the virulence of cholera**, which unmistakeably points to an improvement in the sources from which the supplies of drinking water are drawn. As regards **fever** the results are summed up in the statement that "there has been a movement of the disease from West to the East." The fact of gravest import is, however, the great and widespread increase in the mortality from **smallpox**. The Orissa districts, Midnapore and Singhbhum have suffered most. The Lieutenant Governor concludes that the vaccination department as at present organised is unable to cope with the disease, and the reorganisation of the department is now under consideration. As regards malarial fevers it was proposed to make effective efforts to deal with mosquitoes in Jails so that the results, if successful in these institutions, might serve as object lessons. We agree with the opinion that a decrease in **malaria** can be brought about by active and enthusiastic attacks upon mosquito breeding places and even if not completely successful *a diminution in the amount of Malaria is surely a result worth striving for.* Five-yearly reviews of the sort initiated in the Government resolution are of great value and we would like to see the further development of this method of taking stock and summing up of results.

II. THE UNITED PROVINCES.

Both birth and death rates were above the normal, but the higher **death rate** was most marked, 40 per mille as against the five-year average of 30·9. The excess is probably explained by plague.

The **infantile death rate** is lamentably high, the decennial average (1891-1900) was 229 per mille, but in the past three years it has steadily risen to 274·4, there being a well marked rise also in other provinces. As the result of inquires Lt.-Col. Thompson, I.M.S., the Sanitary Commissioner, looks upon the chief cause to be an extensive and wide-spread **Epidemic of measles**, with its *sequelæ*, bronchitis, &c.,

98,112 fatal cases of measles having been reported ; there was also an increase in the small pox deaths.

There was an increase in the "verified causes of death." The following shows the results :—

"Out of 11,228 verified causes of death, 1,346 are attributed to malarial fevers, 701 to anæmia and debility, 1,620 to dysentery and diarrhœa, 1,215 to pneumonia and other respiratory diseases, 7 to enteric fever, 453 to cholera, 181 to small-pox and 1,791 to plague."

Cholera. An increase, 47,159 deaths or a ratio of ·99 compared with mean of ·74. It was worst in Garhwal and Ballia, and was probably carried to Garhwal from Hardwar.

The small pox death rate largely increased, but is still low, being ·46 as compared with ·05.

Plague caused over 84,000 deaths, a ratio of 1·17 ; the ratio per mille of population of plague deaths in Cawnpore was 11, Allahabad 9, and Lucknow 66. The maximum was attained in March and the minimum in July, as also was the case in 1902. There were only 964 persons inoculated against plague, chiefly Fyzabad, Cawnpore and Meerut. The death rate from "**Fevers**" also rose to 27·6, the quinquennial average being 24, this is probably put down to the late termination of the rains. As regards **antimalarial measures** the following is reported :—

"Civil Surgeons and others in many localities have attempted by precept and example to encourage the destruction of mosquitoes and their larvæ by the addition of kerosine oil to stagnant pools of water, but no organized proceedings on any large scale have been initiated. As will be seen, however, from a perusal of this report, increased efforts are being made in many localities to improve surface drainage, and to bring quinine more generally within reach of the poorer classes."

The **dysentery** and diarrhœa rate is put down as ·85 as compared with ·58 the mean ratio ; the greatest number of deaths took place in June and the lowest number in February. The respiratory diseases ratio were ·50 compared with ·33. It will be seen therefore that the year was an unhealthy one.

The **Amount of Water** supplied per head of population in towns with Water-Works was :—

Benares	15	Gallons.	Meerut	4	Gallons.
Lucknow	5½	,,	Dehra	7	,,
Cawnpore	14	,,	Mussourie	6⅔	,,
Agra	9½	,,	Naini Tal	7	,,
Allahabad	9	,,			

The following is an interesting and on the whole a satisfactory account of the Sanitary management of the great twelfth year **Kumb Mela at Hardwar** :—

The Mágh Mela at Allahabad at the beginning of the year was largely attended, but passed off without mishap.

In April, the great Kumbh Mela, which takes place once in 12 years, was held at Hardwár. Pilgrims began to arrive in the middle of March and by the 28th some 100,000 people were present. Many remained over until the Dikhauti fair on April 13th, and between these dates an average of some 200,000 to 250,000 pilgrims were constantly present on the fair site and in the neighbouring towns of Kankhal and Jwalapur. The arrangements were of a most elaborate description, but as they have been fully described in my report to Government and also in the Government Resolution on the subject, it seems unnecessary to cumber these pages with a repetition. Suffice to say that during this period only 11 cases of cholera and 15 of plague occurred, and in each instance the outbreak was promptly arrested. The great bathing day on the 13th was attended by some 400,000 people, and all went well until the 16th, when some three-fourths of the people had dispersed, and the general and sanitary arrangements were being broken up. Unfortunately on this day cholera broke out with great virulence among the Bairágis, a sect of faqirs, and from thence spread to the other pilgrims still remaining in and about Hardwár, and was by them carried to the Panjáb and the United Provinces—notably in the hill tracts leading to the shrines in the Himálayas.

In November occurred the Dádri fair at Ballia, where for some weeks a great body of people collected, until on the principal bathing day probably not less than 500,000 were present. Although plague existed in the district, not a single case occurred at the fair, and cholera and small-pox were entirely absent. The sanitary procedure was what experience has shown to be most suitable, and has been described elsewhere. No two fairs resemble one another, and the arrangements for every such gathering have to be modified with regard to local circumstances and conditions.

I was present at all these fairs, and was ably assisted by the Deputy Sanitary Commissioners and my staff generally."

III. Madras.

This report consists of the 8th of the Sanitary Board, the fortieth of the Sanitary Commissioner, and the fourteenth of the Sanitary Engineer.

The season was a prosperous one. There is still much to be done before registration is satisfactory and Lt.-Col. King points out that the registration of statistics in villages or town of over 5,000 population is too much for the Village revenue officials. The *birth rate*, on census population, was 31·2, on estimated population 30·6, as against the ten-year average ending 1900 of 28·5. The total *death rate* was but 22, compared with the average 21·4. The infantile mortality was 177, much lower than in the U. P., the increase in the year under report being chiefly in plague infected areas.

Cholera declined, the rate being ·7 against ·8. Madura and Malabar were most affected. It is noted that the Malabar District Board only expended ·23 per cent of revenue on sanitation as compared with an average of 5·57 in the rest of the Presidency. The District Board therefore appear to have been determined to be content with *typhoid*, which has a special predelection for Malabar, and the heaviest mortality for cholera. Such are the blessings of Local Self Government. Lt.-Col. King remarks as follows on the mode of *spread of cholera*.

"So far as the method of spread of cholera is concerned, I see no reason, with further experience, to modify the views expressed by me in my Report for 1893 (page 58 *et seq.*). The chances are, irrespective of well-recognized facts following introduction into a locality, that, in certain areas, the cholera microbe exists in water in a modified or feeble condition and that the epidemic appearance is due to enhancement of its viruleuce following inflow of suitable pabulum, especially from the subsoil and possibly from the surface. At any rate, in this Presidency, cholera is confined in certain districts to certain months with clock-like regularity. The bacteriologist has left the sanitarian with no more information than was obtained by Koch originally as to the behaviour of the cholera microbe. It seems to me there is plenty of bacteriological work applicable to epidemiology that should secure attention. As regards distribution, the sacred river Cauvery is obviously an active agent."

The following note sketches the effects of the efforts to keep **plague** out of the Madras Presidency :—

"A total of 13,291 deaths from plague was recorded, of which 6,203 were cases of females and 7,088 cases of males. The total rate of mortality in the aggregate population of the districts infected was 0·5. Of this figure, the Bellary district contributes the high rate of 6·2. The districts indigenously affected were Anantapur, Bellary, Coimbatore, Kurnool, the Nilgiris, North Arcot, Salem and South Canara. Plague has therefore acquired possession of the central districts of the Presidency. Fortunately, the epidemic in South Canara has never assumed large proportion, and no spread along the West Coast has yet occurred. As a special report is annually made on the subject by me, it is not necessary here to enter into details. I may however state that the policy pursued by the Madras Government has varied little from the commencement of plague in Bombay up to date, except that the great safeguard of early evacuation has been trammelled, so as to give the enemy a decided advantage. The result has been, on the whole, the contesting of the advance of plague inch by inch, as contrasted with a policy that would first permit of its presence being demonstrated and then taking action. The system is not without the drawback of expense ; but even omelettes cannot be made without breaking eggs. During 1902-1903, the total spent on behalf of Local Fund Boards and municipalities under plague charges was Rs 4,03,927, so that the contribution per head of the population of the Presidency for the year was 2 pies. So far as it is possible to gauge facts, it would seem that in restraining the advance of plague throughout the Presidency, the money demanded is well spent, in that trade and lives are husbanded. Even if it so happens the advance of the disease should prove irresistible, and weak measure of attempting to restrain the spread of the disease only after it is proved to be actually present be resorted to, instead of attempting to prevent its securing a foothold, which is the leading feature of the existing policy, the chances are considerable that the inimical result upon public funds would be even more marked than at present, as the producer would be more seriously crippled."

The following extract is of interest as a personal experience, and as bearing on the effects of **drainage, and irrigation** on the spread of the Malarial fevers :—

"Kurnool shows a decrease of 3·9 of the fever rate. The registration is probably fairly correct when judged by the existence of an increased *birth-rate*, the total diminished *death-rate*, and the lack of tendency to quote deaths under any other particular head. This diminution is therefore apparently in direct response to altered conditions as to irrigation surrounding the town. In 1881, when Vice-President of this Municipality, I was able to prove by records in my possession to the Municipal Council that the introduction of malarial fever into the town immediately followed the large use of irrigation in the vicinity, and advised that a zone of a mile radius should be established round the town, in which no wet cultivation should be permitted. Fortunately, the belief deduced from long observation by formerly received authorities as to the influence of moisture on earth and its removal by drainage, which existed at this time, under the

impression that the earth contained the germ (which may yet in part be proved correct) made no difference as to the results. On adoption of this measure, a marked fall of the fever rate occurred: but, as years passed, the Council became less strict in observance of the zone and the fever rate increased. Government recently ruled, on a reference by the Collector of the district, that not the mile zone but the whole of municipal limits should be free of wet cultivation. Cuddapah, which shares with Kurnool the unenviable notoriety of being highly malarious, is also about to secure a dry zone within its municipal limits, which will doubtless prove helpful in restraining the conditions favourable to the incidence of malarial fever. On the opposite, Masulipatam is increasing its wet cultivation in the immediate neighbourhood of the town. I found in pools on its outskirts no lack of anopheles held to be good malaria bearers."

THE following extracts tells us of the foundation of the **King Institute of Preventive Medicine** in Madras:—

"IN contrast with what may be judged to be the carping spirit adopted in respect to measures which, rightly or wrongly, I judge may stay or trammel sanitary advance, it is a pleasure to record that, during the year, Government sanctioned the addition to the group of buildings (which it has been good enough to pay a compliment to the Indian Medical Service by naming the King Institute of Preventive medicine) already in process of erection at Guindy, for the preservation of animal vaccine and bacteriological investigation, a further block for the purpose of serum manufacture and investigation. In pursuing the policy of making this combination, there can be no doubt that Government has placed at the disposal of the medical profession in this Presidency opportunities for research such as, so far as I can ascertam, are no where else procurable with the same facility; whilst both public bodies and private individuals should, in the capability of securing early bacteriological diagnosis of diseases find sound cause for comfort. Lieutenant-Colonel Bannerman, I.M.S., joined for duty on the 10th December as the first Superintendent of the still incomplete buildings. For this post, his long experience of bacteriological work in Bombay should eminently fit him. If to this advance be added the fact already alluded to that Government has called for a scheme for reorganisation of the Vaccination Department of the Presidency during 1903, which if found reasonable, there is evidently a wish to adopt, it may be fairly stated that if in a day, it be not possible to reduce the sanitation of bodies enjoying the privilege of self-government to a state of mechanical accuracy in working that, at least, where advance has been considered feasible by Government the opportunity has been afforded by it."

Lt.-Col King's brother officers appreciate the compliment paid to him in naming the Institute after him. It is a recognition of his long and good work in the Sanitary Department, and we wish the Institute a long life and prosperity.

IV. PUNJAB, 1903.

The **death-rate** rose to 49 per mille, chiefly due to "plague" and "fevers," the **birth-rate** remained fairly steady, being 42·9 per mille. Even excluding plague, which is worked with 10·2 of the total death-rate, the rate is still about 2 per mille above the five years average. Over half a million deaths are reported as due to "fevers," 205,462 to plague, 68,000 to respiratory disease, only 16,498 to diarrhœa and dysentery, 15,635 to smallpox and 14,688 to cholera.

Cholera was epidemic during the year, but yet the mortality was much below that of Bengal, the ratio being 0·73 as compared with Bengal's 2·7 per mille. There was no cholera reported in the first quarter of the year, but it broke out at the great Kumbh Fair at Hardwar about 13th April and followed pilgrims returning from the Fair. Out of 229 deaths in April in 15 districts the first case was that of a pilgrim, returning home from the Fair. The epidemic reached its maximum in July—then slowly declined. Considerably more than half (62 p.c.) of the mortality occurred in the four districts, Ferozepore, Lahore, Ludhiana and Umballa. All appendix to the report shows a considerable reduction in the mortality from cholera in towns provided with a pure water-supply, this being especially the case in Simla.

The **smallpox** mortality was high (·78 per 1,000), it being especially had in the Rawal Pindi District. **Plague** was terribly prevalent during the year, the total mortality amounted to 210,697 deaths. The following facts show the spread of the disease—fourteen districts were infected at the beginning of the year, seven more became infected later on, and four others reported cases which did not give rise to epidemics, no less than 327,357 inoculations against plague were performed during the year, and it is reported that "*the inoculated were everywhere much better off than the uninoculated as regards their liability both to attacks of plague and to deaths when attacked.*"

It is popularly believed that **malarial fevers** are more fatal in damp Bengal than in the dry Punjab, but it may be noted that while the ten years average for "fevers" in Bengal is 22·06 per mille, the mean ratio for the past five years in the Punjab was 23·48. The abnormal rise in several districts in the Punjab is attributed to the abnormal monsoon rains and the inundations. It is interesting to note that there was an outbreak of **cerebro-spinal fever** in the district of Dera Ghazi Khan, where 28 cases were reported. The prevalence of plague sadly interfered with the success of the ante-malarial operations attempted.

V. ASSAM.

The following table gives the **birth-rate** in the various provinces of India:—

BIRTHS REGISTERED.

Province.	1897-1901.	1902.	1903.
	Birth-rate.	Birth-rate.	Birth-rate.
Assam ...	32·21	34·21	35·57
Bengal ...	37·19	40·14	39·00
Central Provinces ..	... *	48·29	45·11
Madras ...	28·9	28·2	31·30
Burma ...	34·68	31·57	33·54
Bombay ...	30·57	34·16	31·22
United Provinces ...	39·65	45·84	46·13
Punjab ...	40·0	43·8	42·91
North-Western Frontier Province.	30·7	38·6	31·56

The following table of **death-rates** is also taken from Colonel D. Wilkie's report:—

DEATHS REGISTERED.

Province.	1897-1901.	1902.	1903.
	Death-rate.	Death-rate.	Death-rate.
Assam	33·90	29·01	26·55
Bengal	30·53	33·43	33·33
Central Provinces ...	... *	25·82	35·52
Madras	22·2	20·2	22·20
Burma	25·79	21·16	24·13
Bombay	42·40	39·04	43·91
United Provinces ...	32·48	32·54	40·28
Punjab	33·71	44·11	49·01
North-Western Frontier Province.	23·7	24·43	28·40

* Not available.

As regards the chief diseases there was a decided improvement in the total mortality in 1903, the ratio per mille being only 26·5 per mille compared with the decennial ratio. **Cholera** had a ratio of 1·58 compared with 3·6 of the decennium 1891-1900. Nowgong district, however, suffered very severely (ratio 6·7.) The **smallpox** mortality was unusually low, and in contrast to Bengal it may be noted that there was in 1901 and 1903 a distinct falling off in smallpox mortality; 1902 was, on the other hand, an exceptionally bad year. The decennial ratio for Assam was 0·62, while that for 1903 was only 0·21.

Plague only appeared at Dibrugarh causing in all 37 cases and 28 deaths.

In view of recent research which tends to show that **kala-azar** as well so-called malarial cachexia is due infection by the Donavan bodies, in fact is a form of trypanosomiasis, the following table compiled by Colonel Wilkie is worth reproduction here :—

Table showing the number of deaths from **kalá-ázár** *registered during the last ten years in the districts of Sylhet, Goalpara, Kamrup, Darrang, and Nowgong.*

District.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.
1	2	3	4	5	6	7	8	9	10	11
Sylhet	2	9	4	..	3	..	3	147	168	721
Goalpara	384	265	298	232	134	161	110	62	49	44
Kamrup	2,149	2,059	2,244	2,756	1,693	1,745	1,262	830	1,014	651
Darrang	1,992	2,477	2,471	3,597	4,113	4,101	2,979	2,446	3,391	2,657
Nowgong	8,585	11,037	10,588	12,012	10,515	8,192	4,661	2,346	1,697	960
Total	13,112	15,847	15,605	18,597	16,458	14,199	9,015	5,831	6,319	5,033

As bearing upon the amount of dysentery shown in the general statistical returns the following quotation is of interest. We quote it *in extenso* :—

"Both civil surgeons and European garden doctors are of opinion that the return of dysentery from tea gardens is in its way quite as inaccurate as that from villages. Apparently, the *gaonbura* tends to return too many deaths under "fever," the garden baboo too many under "dysentery." This is supported by the fact that fever mortality in the general population in 1902 was 3·6 times greater than among the garden coolies, 3·7 times in 1901, and 3·5 times in 1900. Dr. Warren Crowe, of Chhota Pupui, took, as far as possible, the history of every case registered as dysentery during the year, and found that perhaps one in every ten died of acute dysentery, the other nine suffering almost without exception from anæmia and dropsy, and developing dysenteric symptoms during the last few days or week of their lives, and is of opinion that such cases should rather be returned as *ankylostomiasis*. The experience of Dr. Dodds Price, of Salonah, similar to that of jail medical officers, is that most coolies who have suffered from any disease which tends to anæmia succumb to a discharge from the bowel lasting ten or twelve days or longer before death ensues; and that, though this is merely a mode of dying, such cases are entered by the doctor baboos as dysentery. Major Hall also considers that many of the cases registered as dysentery should have been placed under the heading "*ankylostomiasis*." Again, in a certain garden Major Hall found that out of 75 deaths really due to pneumonia, 36 had been returned as pneumonia, 33 as dysentery, 5 as diarrhœa, and 1 as dropsy. It is the experience of Dr. Glover of Scottpore, that many deaths due to pneumonia and *ankylostomiasis* are entered under dysentery and diarrhœa, though the latter were merely terminal symptoms. Dr. Bentley of Borjuli, considers that dysentery and diarrhœa rank third among the principal causes of death in gardens, anæmia and pneumonia usually taking first and second place respectively. Notwithstanding all this, there is evidently among medical officers, official and non-official, a belief which, after a study of the statistics and reports, I share, that there is greater mortality from dysentery in tea gardens than elsewhere. The reasons assigned which seem to me to be the most valid are as follows: Coolies are strangers imported in adult life to new surroundings, new food, new climate, new work, new habits; and dysentery is more common in newcomers than in old resident coolies. Coolies are of low castes, and of careless and dirty habits as to cleanliness of water, food, clothes; and they are, being drawn from the poorer and often half-starved classes of their country, by nature more liable to bowel complaints than the well-to-do villagers of Assam. Many coolies stint themselves in both quantity and quality of food for the purpose of saving money. They are often hurried and careless in their cooking, especially in the busy season, and sometimes cook at one time for four or five days, thus giving their food opportunity to ferment, decompose, or become contaminated. Many of them will eat tainted flesh without hesitation. They sometimes spend too much on alcohol, and so get less food; or, being drunk, lie about exposed to chill. They defecate among the tea bushes, and carry infection on their feet or hands; and they are sometimes earth-eaters. They are not opium-eaters, like the Assamese. They lead a machine life, having to work whether they feel inclined or not; and they have to work regardless of exposure, the busiest season being in the rains. Some of them are exposed to a high temperature in the tea house, and then go out into the cold and wet. The density of population is really greater in the lines than in native village, and there is a want of segregation and disinfection."

As might be expected from an officer of Colonel Wilkie's long experience in statistics, the report is of unusual interest and value.

PUNJAB ASYLUM REPORT, 1903.

THE capacity of the Central Asylum in the Punjab is at 75 sq. feet per patient 630. At the beginning of the year 503 patients were in the asylum 142 were admitted, 19 were readmitted, 40 died, 87 were discharged for various reasons and 539 remained (424 males and 113 females) at the end of the year 1903. The daily average strength was 523, the maximum 554. It will thus be seen that the asylum is well filled, and the number of patients is showing a steady annual increase, probably due only, as Colonel McConaghey says, to "the natural effect of the establishment of a large central asylum." The average number of criminal lunatics was 107. There were 97 admissions for **mania**. In 22 cases the cause of the insanity was unknown, 19 were attributed to *charas* smoking, 13 to grief, 9 to *bhang*, 9 epilepsy, and 7 congen ital. A new female asylum was completed during the year.

BOMBAY ASYLUMS REPORT, 1901-03.

THIS is a triennial report. There are 7 asylums at Colaba, Naupada, Ratnagiri, Poona, Dharwar, Ahmedabad, Hyderabad. The ratio of deaths to total population was in the triennium 62, as compared with 86 for the previous 3 years.

The **total population** of the 7 asylums was 1,114 in the year 1903, including 134 criminal lunatics. Out of 33 cases of persons charged with crimes of violence 8 are attributed to *ganja* smoking.

The following is the capacity of the asylums :—

Colaba	90 Europeans,	168 Natives,	at 50 sup.	feet per head.
Naupada, ...		240	,, ,,	,,
Ratnagiri ...		112	,, ,,	,,
Poona ...		127	,, ,,	,,
Dhurwar ...		88	,, ,,	,,
Ahmedabad ...		118	,, ,,	,,
Hyderabad ...		170	,, ,,	,,

In Dharwar the superficial area of the cells (or shall we say "cubicles") varies from 78 to 123 sq. feet. None, however, of the asylums were overcrowded throughout the year.

Current Literature.

MEDICINE.

The Clinical Importance of variations in Arterial Pressure and in the Effusion of Lymph.—We have recently drawn attention on two different occasions to practical clinical uses of the hæmo-dynamometer in connection with intra-cranial hæmorrhage, and with perforation in typhoid fever. In the Oliver-Sharpey Lectures,* delivered by Dr. George Oliver and entitled "Recent Studies in the Tissue-lymph Circulation," there is indicated a much

* The *Lancet*, April 30th and May 7th, 1904.

wider sphere of for his usefulness instrument in ordinary clinical routine. It is partly for this reason and partly because the lectures throw much light on various physiological processes, and point the way to the solution of important ætiological, diagnostic and therapeutic problems, that they are of prime importance. They are based on over 3,000 observations which bring out the following facts :—

Effects of food on blood-pressure and exudation of lymph.—Before each meal the arterial blood-pressure stands at a level which is found to be constant for the individual, and which Dr. Oliver takes as 100 mm. of mercury, apparently in the superficialis volæ artery. Ingestion of food raises this pressure by 15 to 20 mm., the rise being wave-like in form, reaching a maximum in an hour and-a-half, and lasting, after a good meal, for 3 to 3½ hours before again reaching the normal level. Similarly the venous pressure rises and falls simultaneously; from which it may be inferred that the capillary pressure also rises and falls with the rise and fall of the two pressures between which it lies. Concurrently with these observations others were made on the blood, and these last were made simultaneously under two conditions. In the first, the finger was pricked without previous compression; in the second, this was done after the finger had been compressed by rubber rings. The effect of the pressure in the latter case would be to force out of the compressed part any lymph present in the extravascular connective tissue spaces so that lymph-free blood exudes from the puncture, while in the former case the fluid escaping from the puncture is blood diluted by lymph. When a finger is pricked before a meal the blood drawn before compression and that drawn after compression are identical in composition—there is no appreciable quantity of extravascular lymph. On the other hand, when the finger is pricked without compression it is found that the number of corpuscles, the percentage of hæmoglobin and the specific gravity of the exuding fluid all *diminish* the maximum diminution taking place about 1½ hours after a meal. An increase follows and the whole wave lasts 3½ hours. When, however, the finger is pricked after compression it is found that, after a meal the number of corpuscles, the percentage of hæmoglobin, and the specific gravity all *increase* for 1½ hours and then decrease, the whole wave again lasting for 3½ hours The inference is that the blood becomes more concentrated owing to the exudation from it of plasma after a meal, which, plasma escapes from the vessels into the tissue spaces, forming lymph. This wave-like exudation of lymph exactly corresponds to the wave-like rise in arterial and venous (and inferentially in capillary) pressure, and may therefore be considered to be caused by this increase in capillary pressure. Similarly, other observers have noted a corresponding wave-like increase in the consumption of oxygen and in the secretion of gastric juice after a meal, and all these phenomena are different manifestations of a wide-spread change taking place all over the body at these times. This rise in arterial pressure is cardiac, and the hæmo-dynamometer is in this case cardio-metric.

Another use for the hæmo-dynamometer is brought out in this connection. When a set of muscles is thrown into action before a meal the result is an immediate rise in general arterial pressure, due to the fact that muscular contraction, if complete, causes mechanical compression of the vessels supplying that muscle, obliteration of their lumen, and obstruction to the passage of blood with a rise in general arterial pressure. If, however, the experiment be tried soon after a meal, it will be found that the extent to which a similar contraction of the same set of muscles will raise the pressure is less, and this difference increases for about 1½ hours after a meal and then diminishes, until at about 3½ hours the muscular contraction will raise the arterial pressure to the same height as before the meal That is, the effect of muscular contraction on the arterial pressure follows an exactly similar curve to that of the lymph exudation, and the conclusion is that it is the exudation of lymph into the connective tissue spaces between the muscular fibres which clogs them and prevents their full contraction. This constitutes a test by which may be determined, by means of the blood-pressure apparatus alone, whether or not a rise in arterial pressure is accompanied by an exudation of lymph, without a laborius examination of lymph-free and lymph-diluted blood.

The lecturer, then, has shown that the ingestion of food causes a rise in capillary pressure with exudation of lymph into the tissues. What particular constituent of the food has this effect? It is found that different kinds of food cause different amounts of rise in arterial pressure; a roast meat meal the greatest, namely, 30%; a vegetable meal, one of 12%; a milk meal, one of 7·5%; with each of these test meals the same amounts of sugar and salt were taken. Although a roast meat meal causes a rise of 30% in the arterial pressure, the same meal boiled produces a rise of 7 % only. Further pure proteid, fat, and carbohydrate do not cause any rise; sodium chloride causes a rise, potassium chloride a fall, muscle extractives cause a rise; examples being carnin, creatinin, uric acid, ammonium urate and xanthin, and so does glycogen. Moreover chemical analysis has shown that the foods rich in purin (C_5N_4) are those which raise the blood-pressure and that the extent of the rise is proportional to the amount of purin. Beverages, such as tea, coffee and cocoa, which contain bodies (theobromin, &c.) having a purin basis raise the blood-pressure, as does alcohol. The conclusions arrived at are these : *The food stuffs themselves (proteids, fats, and carbohydrates), do not possess the power of starting the mechanism by which lymph is dispensed to the tissues throughout the body. Associated with these food stuffs in nature are purin bodies, and the volume and duration of the lymph flow corresponds to the amount of these bodies present in the meal. In addition man has by instinct come to add to his food additional substances, such as salt, alcoholic beverages, tea and coffee which cause a large exudation of lymph into the tissues.*

Effects of exercise and rest—It has been stated that muscular contraction usually pr duces a rise in arterial pressure A fuller statement of this phenomenon occurs under the headings of exercise, fatigue and rest. The immediate effect of muscular contraction is to produce a rise of arterial pressure, with effusion of lymph into the tissues of the rest of the body, both phenomena continuing so long as the contraction lasts. When this ceases the pressure falls below the normal line and the lymph at once disappears. Shortly after the pressure again reaches normal and then rises above this line, producing a second effusion of lymph. Soon the pressure again drops to normal and the lymph disappears With each rise in arterial pressure and effusion of lymph the power of muscular contraction to raise the arterial pressure diminishes, just as is the case when the effusion of lymph is caused by absorption of food. When both waves have ceased, however, the power of contraction to raise the arterial pressure is increased; that is, a muscular contraction sets in motion, a series of changes which have the effect, during the subsequent rest, of producing a gain in contractibility. "Therefore, the physiological intent of this lymph flow is to repair and recharge the muscular fibres." The first rise in arterial pressure, that occurring during the contraction, is due as stated to mechanical causes; there is some evidence to show that the second rise, that occurring during rest, is due to the presence in the blood of creatin and ammonium lactate formed during the contraction.

Effects of fatigue.—If muscular contraction continues so long as to cause fatigue the rise in arterial pressure referred to gives place to a gradual fall to the normal, or to a point below the normal, even when the contraction is still going on; the muscular fibres become clogged with lymph so that their contraction does not raise the pressure; this lymph may be got rid off by massage after which contraction will again raise the pressure. In fatigue the loss of vascular tone just referred to is the control fact, and it results in excessive splanchnic vaso-dilatation as the following experiment shows. If a shot bag weighing 14 lbs. be placed on the abdomen of

a healthy individual there is no alteration in arterial pressure. If, however, the arterial tone and pressure be lowered by fatigue the shot bag will cause an immediate rise That is, in fatigue the blood drains downwards into the toneless splanchnic vessels with lessened supply to brain and muscles, and the fluid transfer becomes more splanchnic than systemic.

Effects of sleep.—Similarly during sleep there is vaso-motor relaxation, the arterial pressure falls, but the venous, and inferentially the capillary, pressures rise ; as in fatigue the abdominal shot bag raises the arterial pressure by $\frac{1}{5}$; there is a large amount of lymph effused—nature's intent is obviously restoration. This is confirmed by the fact that on waking in the morning, and testing the blood to determine that the lymph effused during sleep has been absorbed and will not therefore interfere with the muscular contractibility, it will be found that after a good night muscular contraction will raise the arterial pressure by 50% where as if the night has been disturbed and there is a feeling of slackness the pressure will not rise over 30% used in this way the hæmadynamometer affords correct readings of the tone of the muscles.

Effects of gases.—Space only allows of touching on the effects of the respiration of gases. Inhalation of carbonic acid raises the pressure by arterial contraction ; if the respiration of this gas ceases the arterial pressure falls at once to normal. This may be used to test the efficiency of ventilation of a room. Sewer gas causes a rise of arterial pressure with artereal dilatation and excessive lymph exudation, and the sewer men early become rheumatic or quasi-gouty, an important indication in the pathogeny of gout

Effects of adrenalin —The action of adrenalin illustrates well the conditions under which high arterial pressure does or does not produce a flow of lymph This drug raises the arterial pressure in two different ways, by cardiac stimulation and by arterial constriction; in small doses of gr $\frac{1}{4\,5\,0}$ the former predominates, in larger the latter. If the small doses are given there is a rise of arterial pressure due to increased heart's action, which throws increased pressure on the capillaries and causes an increased exudation of lymph confirmed by the blood and pressure tests If the dose is raised to three times the amount arterial constriction predominates, so that the capillary pressure is lessened ; there is a high rise of arterial pressure with no lymph exudation at the height of the contraction. As a therapeutic measure the smaller dose is suggested in a tumbler of water with meals in such diseases as phthisis in which a flow of tissue lymph is indicated.

Effects of Thyroid Extract—Thyroid extract is a cardiac depressant, produces a fall in arterial and capillary pressure and a diminished flow of lymph, a fact which explains its use in reducing obesity. Warmth dilates the arteries, causes an increase of veinous and capillary pressure and a flow of lymph cold has the contrary effect.

Practical deductions —The practical deductions which Dr. Oliver draws are as follows : If the arterial pressure be taken before meals and apart from exercise a good uniform and reliable base line is obtained. If the observation cannot be made at this time, a useful correction to the disturbing effect of digestion on the arterial pressure is to deduct from the pressure obtained 15 mm. of mercury in the first hour, 10 in second, and 5 in the third, normally before a meal when the arterial pressure is on this base line, there is no lymph in the tissues—the lymph effusion is intermittent.

In hypotonic states of the arterial pressure, which are characterised by splanchnic stasis, the arterial tension falls to the base line too soon after a meal, the digestive lymph wave is shorter and smaller than normal, and the tissues are imperfectly nourished. It is important in these cases to raise the arterial and capillary pressures by food stuffs rich in lymph factors, and to guard against further splanchnic vaso-dilatation by limiting exercise (*i.e.*, avoiding fatigue) and prolonging the intervals of rest. Hence the value of forced feeding in cases of neurasthenia and phthisis.

On the other hand, in hypertonic states, such as gout and chronic goutiness, the arterial and capillary pressures never fall to the normal line and the tissues are permanently bathed in lymph, there being no intermission in the effusion, but a remission only. It is necessary here to limit the lymph wave by excluding excess of oxogenous lymph factors, preferring fish and white meats to beef and mutton, and these boiled to those roasted or fried. Foods free from poison and causing no reaction in the circulation are eggs, white bread, rice, tapioca, and green vegetable ; potatoes, butter and cheese are practically free. An excess of sodium chloride renders futile all forms of dietary in gout ; it should be combined with or replaced by potassium chloride. All alcoholic beverages except gin increase the amplitude of the digestive wave, brandy the most, wines next, whisky least. Gin owes its exceptional property to the juniper it contains. The methyl poisons of tea, coffee and cocoa are less active in this respect than alcohol, according to Dr. Oliver's experience "when in a case of gout, the diet has been properly adjusted the normal intermission in tissue lymph circulation are restored ; there is then no longer need for further restrictions and it is rarely necessary to make the dietary irksome, if only the rules imposed are faithfully observed."

In addition to diet as a means of regulating the lymph circulation, the investigation points the way to the marked value of certain drugs in this direction. Lowering of arterial pressure with establishment of a normal intermittency in lymph exudation may be induced in high tension cases by the administration of Witte's peptone in doses varying from $\frac{1}{2}$ to 1 grain, accompanied by a marked improvement in the general health. Conversely glycogen in 1 grain doses and lacvulose in 20 or 30 grain doses are indicated as useful vaso-tonics and renovators of muscular contractibility in hypotonic conditions such as phthisis and neurasthenia. The latter has already proved to be strikingly curative in phthisis.

The lecturer's concluding words are "By studying the conditions which increase or decrease lymph effusion we ought to gain a clearer insight how to control derangements of nutrition and metabolism." If this is true at home, it is at least equally true in India.

C. L.

FOREIGN EXTRACTS.

The proportions of the female frame.—The following canons as to the female form divine may be of interest to our readers They are taken from *Die Schoenheit des weiblichen Koerpers*, the work of Dr. J. Stratz, who was for many years in practice as a gynæcologist in Java, and has, since his return to Europe, busied himself with matters medico-artistic. It is matter of notoriety that while the artist has his ideas as to beauty, the medical man has his, and these are supposed to be based on his anatomical and physiological knowledge ; but are too often evolved out of a misunderstanding of what he has read in an Art publication. When then a medical man and an artist like our colleague Stratz, has something to say on the subject of physical beauty, what he says is worth pondering over.

Measurements. — The measurement across the shoulders should exceed that across the hips by at least 4 cm. and the waist measurement by at least 16 cm.; while the hip measurement should be at least 12 cm. greater than the waist, the intertrochanteric measurement being at least 2 5 cm. greater than the distance between the iliac crests, which should be at least 3 cm. greater than that between the anterior spines, which should never be less than 26 cm., that between the posterior spines being at least 10 cm and that between the nipples at least 20 cm.

The height of the forehead is that of the nose, of the mouth taken with the chin, and of the ear. The inter-temporal diameter corresponds to the length of the face; the upper extremity and the trunk are three heads in length, the lower extremity being four heads long, and the shoulders being two heads broad. The length of the palpebral slit bears to that of the buccal slit, and that of the face, the proportions 2 : 3 : 5.

The measurement in cm. round the chest, multiplied by the height in cm., and divided by 240 ought to give the body-weight in kilogrammes. We now come to the qualities, and defects which may exist in the various parts of the body, and of these we give an exhaustive list, compiled from the tabular statements given by Stratz :—

Body	symmetrical	assymmetrical.
Body-centre	low-placed	high-placed.
Skin	fine, smooth, elastic	coarse, wrinkled, sagging.
Muscles	uniformly developed	some more developed than others.
Bones and joints	delicate	coarse, massive.
Forms	rounded	angular.
Hair of scalp	long abundant	short. scanty.
——— pubis	upper limit low and straight	upper limit high, forming an acute angle.
——— axilla	scanty, short	long abundant.
——— body	none	present, with a moustache.
Skull	rounded	angular.
Face	small, uniformly rounded	large, prominent cheek-bones and jaw.
Orbits	large	small.
Eyebrows	high, narrow	low, thick.
Palpebral fissure	horizontal	oblique.
Nose	straight, narrow	broad, snubnose.
Upper lip	gently convex	too prominent, short, or thick.
Teeth	vertical and regular middle incisors broad	oblique and irregular, middle incisors narrow.
Chin	rounded with a dimple	double chin, pointed chin.
Lower jaw	low and narrow, not markedly distinct from line of neck.	high and broad, markedly distinct from line of neck.
Neck	rounded	angular with prominent larynx.
Shoulders	rounded	angular,
Clavicles	straight, slender	incurved, thick.
Thorax	rather long and narrow, swelling uniformly	rather short and broad, flattened, oblique, pigeon-breasted or barrel-chested.
Breasts	high, round, firm	low, flattened, flaccid, pendulous.
Abdomen	slightly rounded	pointed, pendulous, barrel shaped.
Pubic arch	low, forming an open angle	high forming an acute angle.
Spine	straight	curvature.
Back	convex	flat, or rounded.
Loins	curved, with two dimples	straight.
Waist	tapering	scarcely marked.
Arms	straight	forearm at an angle with upper arm, styloid process of ulna prominent.
Elbows	rounded	pointed.
Wrists	small	thick.
Hands	small, narrow and long	large, broad and short.
Fingers	index longer than 4th finger	4th finger longer than index.
Nails	convex, long	flat, broad.
Buttocks	rounded, prominent	small and flat.
Thighs	plump and rounded	thin and flattened.
Knees	delicately rounded	coarse and angular.
Legs	long and straight	short, knock-kneed, or bow-legged.
Calves	rounded	angular.
Ankles	fine	thick.
Feet	thin, long	thick, broad.
Toes	narrow, 2nd toe longest, 5th toe very small	broad, great toe longest, 5th toe much developed.

We may further note that according to Fritsch—*Verhandlungen der Berliner anthropologischen Gesellschaft*, 1895—the breadth between the shoulders-joints should be half the distance between the base of the nose and the upper border of the symphysis pubis, the distance between the hip-joints being half that between the shoulder-joints The length of the upper arm should be the distance between a shoulder joint and the nipple of the opposite side, that of the fore-arm being the distance between a nipple and the umbilicus, while that of the hand is that between a hip-joint and the umbilicus. The length of the thigh should be the distance between a hip-joint and the nipple of the opposite side, that of the leg being the distance between a hip-joint and the nipple of the same side of the body in a woman.

W. D. S.

Correspondence.

SANITARY INSPECTORS IN MADRAS.

To the Editor, "THE INDIAN MEDICAL GAZETTE."

SIR,—In your issue of 12th September 1904, under the heading of "Reviews," you notice a new Medical Journal published in Madras, and repeat unwittingly a very gross misstatement in the leading article of its first issue, which is likely to damage the status of a hard-working body of men in this Presidency, known as Certificated Sanitary Inspectors—and not C. S. I.'s as the author, with stale and borrowed facetiousness, states. Having first of all erroneously assumed that the men were of the most indifferent educational status, the author proceeded to maintain that they secured the pay of Rs. 70 "after ten days' training" in my office. I am not disposed to give, through your medium, more advertisement to a Journal of the type concerned than essential for my purpose, and therefore instead of taking the trouble to confute statements made by it *seriatim*, I would enumerate exactly the conditions that really apply to these men. As a similar movement as to qualified Sanitary Inspectors has not been general throughout India, I trust the facts may not be without some interest to your readers, whilst I, at the same time shall fulfil my duty towards a body of men who have thus been so ruthlessly and ignorantly attacked.

In 1894, at my suggestion, the Madras Government sanctioned the opening of a Sanitary Inspectors' class in the Madras Medical College. The course prescribed was four months' teaching in Hygiene by the Professor of Hygiene, whilst I (aided in certain years by the Deputy Sanitary Commissioner) undertook practical out-door demonstrations to the class, which usually extended over six weeks. The

class of men admitted were at first, compulsorily, all Sanitary Inspectors under five years' standing in actual employ of Local Bodies at time of passing of the Government Order, and voluntary candidates who were matriculates, whilst a certain number of places were reserved for men who were not matriculates but who were nominated by me. In 1898, the course was added to by the Assistant Professor teaching Physiology; but the examination in this subject was not compulsory. In 1903, it was ruled that none but matriculates would be allowed to enter the class. The course in Hygiene was increased to five months, and included a compulsory course of physiology and bacteriological demonstrations in the Medical College. On passing the prescribed examination in Hygiene and Physiology the candidate has the right to a Certificate as Assistant Sanitary Inspector, but if he wishes to gain the grade of Sanitary Inspector he must undergo a course of Minor Sanitary Engineering extending over a further five months, in the King Institute, Madras. The first class of this nature is at present assembled, and is instructed by the Assistant Sanitary Engineer.

As regards the general educational qualifications of these men, until the rules of 1903 came into force, necessarily, they varied somewhat; as a result of my right of nomination, *and the fact that men already in employ had to be admitted for training and examination.* But, taking the facts as they stand at this date, I find that of a total of 571 now entitled to certificates of qualification, their educational qualifications as far as known, after every effort to secure correct registration, are, *per cent.* as follows:—B. A.'s, 1·6; F. A.'s, 4·4; Matriculates of a University, 58·2; Uncovenanted Civil Service Examination, 7; Upper Secondary, 1·4; Lower Secondary and Middle School, 8·4; L.M.S. Degree, Madras University, ·3; Hospital Assistants, ·4; Diplomates in Agriculture, ·3; Certificated Surveyors, 1·4; "Unpassed" candidates, including all whose educational qualifications have not been registered and are unknown, 19·3.

As regards their being entitled to Rs. 70, pay which is the burden of the new Journal's complaint, I may state that their pay varies from Rs. 23 to Rs. 70, *plus* possible pony and fixed travelling allowances, according to the nature of their duties, grade and experience—the highest pay of Rs. 70 being when in charge of posts in Municipalities as "Chief Sanitary Inspectors." Their best prospects are, however, offered by the Vaccination Department into which, after a special additional course in human and animal vaccination and training in office work, they are admitted as Deputy Inspectors of Vaccination.

There is no reason at all why these men should be contrasted with Hospital Assistants. They are confined strictly to sanitary duties, and do not meddle with medical work. Unlike Hospital Assistants they have to bear the cost of their own education entirely, and are usually of better castes. Necessarily, in the case of executive sanitary work in the midst of a native population, caste is a matter worthy of consideration. On the other hand, unlike Hospital Assistants, they have no pensions, and, as has occurred in several instances when on plague duty, when attacked by that disease they have been struck off pay by local authorities employing them, from date of sickness.

But the author of the article referred to had sufficiently vague ideas of sanitary organization in Madras, to mix up the question of pay and status of *Certificated Sanitary Inspectors* with Temporary Sanitary Inspectors. Although, as shown above, there are now no less than 571 Certificated Sanitary Inspectors, the stress of plague and routine sanitary work have been such that I have found it necessary to supplement them by *Temporary* Sanitary Inspectors *for plague duty.* These men receive not "ten days" but sixteen days practical and theoretical training, on the subject of plague. Their duties are of a decidedly stereotyped nature, and although, if available, the man with larger knowledge of sanitation—the Certificated Sanitary Inspectors—is always preferred for plague work, the Temporary Sanitary Inspector is by no means a man to be despised. It is true that in the space of 16 days he has to assimilate the whole subject of plague; but no more allusion to other sanitary duties is made than absolutely necessary, seeing that permanent staffs are available for routine sanitary work. This period certainly gives plenty of opportunity for lecturers to hand over any knowledge they have on the subject to all capable of assimilating it. But, whilst satisfied with such men to fill blanks *as a temporary expedient*, as a fact, a scheme has, for some time past, been before the Government of Madras for their better education and organization. These men receive pay, according to their duties, from Rs. 20 to Rs. 40, and fixed travelling allowance and pony allowance when the nature of their duty demands such allowances. Several have died of plague within a very short period of service. This pay for an appointment that may cease at any moment without prospect of leave of any sort, does not seem to me such as ought to excite the envy of Hospital Assistants. However, it may satisfy them to know as educated natives are no longer afraid to undertake plague duty, the pay allowed is about to be reduced, and, this being so, it is hoped Hospital Assistants will no longer break the tenth Commandment.

Yours, &c.,
W. G. KING,
LT.-COL., I.M.S.

MALIGNANT DERMOID CYST.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—There was an omission, which I wish to rectify, in the pathological report contained in the article on a case of Malignant Dermoid Cyst of the Neck which appeared in the August number of the *Indian Medical Gazette.* The omission was intentional, the matter not being referred to at that time because, although I am assured of the correctness of the observation, yet it is not established with the same degree of certainty as are the other facts mentioned; and had it been brought forward at the same time and in the same manner as they were, it would probably have thrown upon them unmerited doubt. In the fluid drawn off from the cyst before operation there were present bodies which I did not identify at the time, but which further experience and a fairly vivid recollection of their appearance leave me in little doubt were protozoa. Of this however, since no drawings were made at the time, I have no proof to show, nor have I any claim to make. The point which I wish to emphasise is the possibilities which these cystic cancers appear to afford in the determination or otherwise of the protozoal causation of cancerous growth. Judging by analogy we should expect that if cancer is caused by protozoa, these bodies would go through a phase of development outside the body of the host. For example, in the intestine of the cockroach the young forms of protozoal parasitic gregarines are found in the epithelial cells, and the adult forms in the lumen of the gut. If "cancer bodies" are protozoa it is to be expected that some such free stage takes place, but these forms will in an ordinary cancerous ulcer, be swept away by the discharge and lost. In the case of a cystic cancer, on the contrary, this phase, or at least its first stages would be carefully conserved in a comparatively confined space and be available for ready examination, as I believe they were in the case referred to. It is however, unfortunately, but rarely that a cystic cancer occurs, a fact which makes it all the more imperative to make the most of such opportunities; and it is in the hope that this hint may lead to careful investigation of the fresh fluid from cystic malignant growths that it is mentioned at all, and not disregarded as an imperfectly established fact.

I am, &c.,
CLAYTON LANE, M.D. (LOND.),
CAPT., I.M.S.

DIPHTHERIA IN HYDERABAD (DECCAN).

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—During the last five years I have come across only three genuine cases of diphtheria in Hyderabad. From one of these a pure culture of Diphtheria Bacillus was obtained, which in morphological and cultural characters and in pathogenic effects upon animals, proved to be identical with the specific bacillus discovered by Klebs and Loeffler. Hence it is clear from this, that diphtheria does occur in tropical climates. It occurs in sporadic form as far as my knowledge goes, and in cold weather.

The urine in all the three cases contained albumen and casts which could not be detected in the urine of several cases of severe throat affections.

The presence of albumen and casts in the urine of a child suffering from throat affection but otherwise healthy, induces me to the conclusion that the case is one of diphtheria.

As the examination of urine is a simple test, I should like to impress the medical profession to make use of it often for the diagnosis of diphtheria, as I believe it to be a safe and a very reliable test. This naturally is of more importance in places where bacteriological examination is not possible. The test is simple to carry out, and takes only a few minutes to come to a definite conclusion.

I have written these lines in order that the medical men who have more opportunities to see such cases should verify or refute the statement.

Yours, etc.,
S. MALLANNEH, M.D. (EDIN.),
D.P.H. (CAMB.),
Lecturer, Medical School

CHLOROFORMED VACCINE LYMPH.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—In your issue for September you state that "We understand that Capt. Clemesha, I.M.S., Deputy Sanitary Commissioner, Bengal, has been experimenting with success on chloroformed calf vaccine."

In the absence of my colleague, Capt. Harvey, should like to point out that—

(1) The question of chloroformed calf vaccine has already been thoroughly worked out by Capt. W. F. Harvey, M.B., D.P.H., I.M.S., Deputy Sanitary Commissioner, Punjab.

(2) H. H. The Lieutenant-Governor of the Punjab, in consequence of Capt. Harvey's report, has ordered the issue of chloroformed glycerinated vaccine in place of the vaseline paste previously employed.

(3) Capt. Harvey's report—a copy of which will doubtless reach you in due course—is at present in the press.

Your, etc.,
W. H. C. FORSTER, M.B., D.P.H.,
CAPT., I.M.S.,
Offg. Deputy Sanitary Commissioner, Punjab.

"WIDOWS' PENSIONS."

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—With reference to the letter on Widows' Pensions in your September number, I can say that to my knowledge, I know a widow of a Captain of about eight years' service, who receives £80 per annum from the Military Service Pension Fund, and also £40 from the Queen's Compassionate Fund for widows of officers. The rules, &c., of the latter Fund can, I daresay, be obtained from the India Office.

Yours, etc.,
KNOWLEDGE.

"FAMILY PENSIONS."

The India Office Rules for candidates says :—

"The claims to pension of widows and families of officers are treated under the provisions of such Royal Warrant regulating the grant of pensions to the widows and families of British officers as may be in force at the time being.

"The widows and families of officers are also entitled to pensions under the Indian Service Family Pension Regulations, for the benefits of which all officers must, as a condition of their appointment, subscribe from the date of their arrival in India."—[ED., *I. M. G.*]

Service Notes.

COLONEL H. HAMILTON, M.D., C.B., I.M.S., is given a good service pension from 25th October 1904, in room of Colonel G. McBride Davis, I.M.S., D.S.O., C.B., who retired with the special additional pension of £250.

Colonel Hamilton entered the service on 31st March 1876, attained to the brigade grade on 20th May 1898, and full Colonel on 1st October 1902. He spent his career in military employ, in Pioneer, Cavalry, and Goorkha Regiments, he was S.M.O., of No. 2 General Hospital in China in 1900-01; P.M.O., Peshawar District, 1901-02; P. M. O. Derajat, April 1902; P. M. O., Presidency, May to November 1902, and P. M. O., Lahore, from 1st October 1902 to date.

He became Lieutenant-Colonel on 31st March 1896, and for good work in Tirah Campaign was promoted to Brigade Surgeon Lieutenant-Colonel in 1898. His other War services are Afghanistan 1878-79 80; action of Charasiah, at Kabul, at Shekabad, Roberts' march from Kabul to Kandahar, mentioned in despatches. medal, 3 clasps and bronze star Chitral 1885; medal and clasp, N. W. Frontier, 1897-98; two clasps, mentioned in despatches, China Expedition, 1900, medal.

THE Government of India have decided that the height of chargers for Medical Officers whether serving with cavalry or not, should be limited to a maximum of 14—2, and a minimum of 13—3 hands.

CAPT. E. E. WATERS, I.M.S., is appointed Resident Physician, Medical College, Calcutta, but remains as Officiating Civil Surgeon of Purl

CAPT. N. S. WELLS, I.M.S., is appointed Civil Surgeon of Khulna.

MAJOR J. C. S. VAUGHAN, I.M.S., on return from furlough acted as Civil Surgeon of Patna, during absence of Lt.-Col. Whitwell, I.M.S., and was afterwards appointed to Monghyr as Civil Surgeon.

CAPT. A. LEVENTON, I.M.S., is transferred to Silchar as Civil Surgeon of Cachar District.

LT.-COL. HENDERSON, F.R.C.S.I., is appointed P. M. O. at Aden.

THE *Somaliland Honours*—Col. J. F. Williamson, R.A.M.C., G.C.M., is made a C.B.

CAPT. CORRIE HUDSON, I.M.S., Capt. A. E. Hammerton, R.A.M.C., and Lieut. J. H. Horton, I.M.S., get the D.S.O., and 3rd Class Hosptial Assistant Ali Khan of 69th N. F. Hospital, is mentioned in despatches.

THE arrival at home is reported of Lieut. R. M. Carter, I.M.S., Capt. S. R. Godkin, I.M.S., and Captain J. W. Cornwall, I.M.S.

MAJOR W. L. PRICE, I.M.S., and Lieut. G. C. Robertson, I.M.S., both get six months' extension of leave on medical certificate.

LT.-COL. D. FRENCH-MULLEN, I.M.S., Major W. R. Edwards, C.M.G., I.M.S., Colonel J. S. Wilkins, I.M.S., Major S. Browning-Smith, I.M.S., Capt. C. E. Charles, I.M.S., and Capt. G. Bidie, I.M.S., are permitted to return to duty.

THE services of the undermentioned officers are placed temporarily at the disposal of the Government of Bombay :
Major W. S. P. Racketts, M.B., I.M.S. (Bombay).
Captain K. V. Kukday, I.M.S. (Bombay).
Captain W. O'S. Murphy, M.B., I.M.S.

MAJOR A. E. ROBERTS, M.B., I.M.S. (Bengal), Statistical Officer to the Government of India in the Sanitary and Medical Departments, is appointed sub. *pro tem.* to be Secretary to the Director-General, Indian Medical Service, with effect from the date on which he assumes charge of his duties.

CAPTAIN S.P. JAMES, M.B., I.M.S. (Madras), on special duty under the orders of the Sanitary Commissioner with the Government of India, is appointed sub. *pro tem.* to be Statistical Officer to the Government of India in the Sanitary and Medical Departments during the absence on deputation of Major A. E. ROBERTS, M.B., I.M.S. (Bengal), or until further orders.

WE regret to record the death of Major George Brooke French of the Indian Medical Service, who died recently at Tunbridge Wells, and was a graduate of the University of Edinburgh. He obtained his M.B. in 1894, and was prizeman in a number of subjects and took first-class honours in many others. He was also gold medallist in medical jurisprudence and prizeman in surgery in the Edinburgh School of Medicine. He qualified as a member of the Royal College of Surgeons, England, in 1885, and as a Licentiate of the Royal College of Physicians, London, the following year in which he joined the Indian Medical Service. In 1891 he took part in the expedition to Manipur, for which he had the medal with clasp, and in September 1898, became a Major, and for some years has been in civil employ in the United Provinces.

WE understand that Lieut.-Col. B. O'Brien, M.D., will soon retire. He was born in 1848, entered the I.M.S. in October 1872, and served for many years as Civil Surgeon in the United Provinces, where he was well known as a skilful physician. He was last year promoted and appointed P. M. O. Presidency District, but was obliged to go home on sick leave.

LIEUT.-COL. F. R. SWAINE, I.M.S., Civil Surgeon of Champarun, retired from the service on 1st November. He entered in September 1873, and was for many years Civil Surgeon of Ranchi, and afterwards of Champarun.

MAJOR H. HERBERT, F.R.C.S., I.M.S., Ophthalmic Surgeon, Bombay, has been permitted to return to duty within the period of his leave.

HONY. LIEUT. E. P. CLEMENTS, I.S.M.D., Civil Surgeon, Hardoi, U. P. has been

CAPT. R. G. TURNER, I.M.S., Civil Surgeon, Etawah, U. P., has been granted leave, and Capt. T. W. A. Fullerton, I.M.S., holds visiting medical charge of the district.

CAPT. H. M. CRUDDAS, I.M.S., relieved Lieut. W. W. Jeudwine, I.M.S., of the Civil medical duties at Mardan.

ASST. SURGEONS RAI M. L. MUKERJI, BAHADUR, K. L. Sannyal, and J. N. Ghosh are appointed to be Civil Surgeons in Bengal.

CAPT. A. G. MCKENDRICK, I.M.S., has been granted six months' leave on medical certificate. Pension service four years, commenced 27th June 1904.

LIEUTENANT A. T. PRIDHAM, I.M.S., is appointed to the officiating medical charge of the 2nd (Q. O.) Rajputs.

MAJOR D. PRAIN, I.M.S., Director, Botanical Survey of India, is granted 13 months' combined leave from 27th October, and Captain A. T. Gage, I.M.S., Curator of the Herbarium, acts as Director.

MAJOR D. G. MARSHALL, I.M.S., has been transferred to the temporary half pay list from 23rd September 1904.

CAPTAIN C. J. ROBERTSON MILNE, I.M.S., has been appointed temporarily to act as a Deputy Sanitary Commissioner in Bengal and posted to Purulia.

THE order giving six weeks' privilege leave to Captain Goodbody, I.M.S., Superintendent of the Lucknow Central Prison, was cancelled in the *U. P. Gazette*, dated 10th September.

CAPTAIN F. H. WATLING, I.M.S., who has recently joined the Central Provinces, is posted as Civil Surgeon, Sambalpur, C. P.

IN the case of an officer (of the Indian Army) taken for employment under the Imperial or Colonial Government, he will be seconded from date of embarkation.

THE services of Captain N. P. O'G. Lalor, I.M.S., are placed at the disposal of the Government of Burma.

THE services of Captain D. C. Kemp, I.M.S., are placed at the disposal of the Government of Madras.

CAPTAIN E. D. W. GREIG, I.M.S., who has been on special duty in Uganda for the investigation of sleeping sickness, has been granted nine months' leave out of India.

SURGEON-GENERAL SIR WM. ROE HOOPER, K.C.S.I., I.M.S. (retd.) has been appointed Honorary Surgeon to the King from 6th August 1904, *vice* Deputy Surgeon-General Cayley, C.M.G., deceased.

A FAREWELL dinner at the Residency was given to Colonel Benson, I.M.S., on his leaving Mysore after nearly thirty years' service in that State. Colonel Benson is now P. M. O., Madras, and has been Senior Surgeon and Sanitary Commissioner, Mysore, since 1896.

COLONEL J. P. GREANY, I.M.S., P. M. O., Sind, has been granted seven months' combined leave.

CAPTAIN C. HUDSON, I.M.S., is granted three months' leave.

CAPTAIN E. E. WATERS, I.M.S., Civil Surgeon of Puri, was granted 15 days' privilege leave from 1st October.

CAPTAIN N. S. WELLS, I.M.S., is appointed Civil Surgeon of Khulna.

MISS A. M. BENSON, first Physician to the Kama Hospital, Bombay, has been granted an extension of furlough up to 26th November 1904.

CAPTAIN C. H. S. LINCOLN, I.M.S., has handed over charge of the Karwar Prison to Mr. K. B. Bhide.

THE new Regulations for the admissions of Hospital Assistants, Civil and Military, appeared in the *Bombay Gazette* for 15th September 1904.

CAPTAIN W. E. SCOTT MONCRIEFF, I.M.S., is granted one year's leave out of India from 18th September 1904.

LIEUTENANT-COLONEL W. G. H. HENDERSON, I.M.S., F.R.C.S.I., is promoted Colonel while acting as P. M. O., *vice* Colonel Wilkins, I.M.S., on leave, with effect from 19th August 1904.

CAPTAIN MICHAEL O'MEALY, I.M.S.D., is permitted to retire.

MILITARY ASSISTANT SURGEON R. T. ROGERS is posted to Amraoti District as Assistant to the Civil Surgeon.

CAPTAIN W. J. MONTGOMERY has returned to Wun, C. P., as Civil Surgeon.

HONY. LIEUTENANT G. HYNES, I.S.M.D., is granted one month's privilege leave.

MAJOR J. K. CLOSE, M.D., I.M.S., held visiting medical charge of Pilibhit District during absence of Lieutenant G. Hynes.

LIEUTENANT-COLONEL W. O'HARA, I.M.S., Inspector-General of Prisons, Madras, is "undergoing training as a District P.M.O." as the monthly Disposition return somewhat briefly puts it.

LIEUTENANT-COLONEL J. C. MARSDEN, I.M.S., was granted combined leave from 6th September 1904.

CAPTAIN H. KIRKPATRICK, I.M.S., returned from leave on 24th October 1904, part of the leave was privilege leave, but 5 months and 26 days are recorded as "Study leave." This is the first time we have seen this "study leave" gazetted.

A VERY successful *impromptu*, I. M. S. Dinner came off at the Darjeeling Club on Wednesday, 19th October. The following officers were able to attend:—Colonel McKay, P.M.O., Presidency District; Major Clarkson, Sanitary Commissioner; Major W. J. Buchanan, I.-G. of Prisons; Major F. P. Maynard, Civil Surgeon, Darjeeling; Major F. O'Kinealy, Civil Surgeon, Midnapore; Captain E. Waters, Civil Surgeon, Puri; Captain Black, Officiating Chemical Examiner; and Captain Emslie Smith, 3rd Brahmins, Buxa, Duars.

CAPTAIN H. J. K. BAMFIELD took over the Civil Medical duties of Bannu from Captain J. Husband, I.M.S., on 25th August.

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will **receive 25 Reprints gratis**, if requested.

Communications on Editorial Matters, **Articles, Letters and Books for Review** should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscriptions to the Indian Medical Gazette, Rs. 12, *including postage, in India. Rs.* 14, *including postage abroad.*

BOOKS, REPORTS, &c., RECEIVED.

Ott's Text-book of Physiology (F. A. Davis Co.)
Mansell Moullin's Enlargement of Prostate, 3rd Ed. (H. K. Lewis.)
Gibson's Nervous Affections of the Heart (Young J. Pentland.
H. E. Lord Curzon's Speeches on India (J. Murray.)
Major A. Buchanan's Report on Lathyrism.
Capt. L. Rogers' on Unhealthiness of Diuajpur District.
Morphology of the Flowers of Cannabis. By Major Prain (*Sci. Memoirs*, No. 12).
Christopher's Parasite in Spleen (No. 11, *Sci. Memoirs.*)
Agricultural Ledgers, Nos. 10, 11 and 12.

ACKNOWLEDGMENTS, COMMUNICATIONS RECEIVED FROM:—

Major Wimberley, I.M.S., Tibet; Lieut.-Col. King, Madras; Lieut.-Col. Peck, I.M.S., Calcutta; Lieut L. B. Scott, I.M.S., Chitral; Major D. W. Sutherland, I.M.S., Lahore; Capt. Evans, I.M.S., Lahore; Dr. N. C. N. Row, Madras; Lieut.-Col. Maitland, I.M.S., Madras; Capt. Gordon-Tucker, I.M.S., Bombay; Capt. L. Rogers, I.M.S., Calcutta; Secretary, R. Institute of Public Health, London; the Master of the Rotunda, Dublin; Colonel R. Macrae, I.M.S., Nagpur; Capt. Ralt I.M.S., Chapra.

Original Articles.

FURTHER NOTES ON THE TREATMENT OF LEPROSY BY INJECTIONS OF LEPROLIN.

BY E. R. ROST,

CAPTAIN, I.M.S.,

Rangoon.

SINCE publishing the former two papers on this subject in the *Indian Medical Gazette* for May and June of this year, a considerable amount of progress has been made, both in the treatment of cases of leprosy by many medical officers, and in the preparation of the cultivations and the manufacture of the leprolin, and a few Medical Officers having sent in detailed reports on their observations of the treatment, the following information would appear called for.

The preparation of the medium and the cultivation of the bacillus.

I have found that the solid extract of beef, one ounce dissolved in two ounces of water and soaked in pumice stone, previously cleaned and dried placed in bottles inside the autoclave, as described in the last communication, gives the best medium for growing this bacillus. The first fluid of condensation has the greatest nutrient value, and the nutrient value of the fluid of condensation becomes weaker and weaker the longer steam is allowed to pass through the bottles of pumice. One ounce of beef extract will give two thousand cubic centimetres of nutrient fluid in which the acid fast bacteria will grow with the greatest ease, and the leprosy bacillus will give a culture which will be ready for reducing to leprolin in from six weeks to two months in this medium. For the purpose of stock cultures of the bacillus, the fluid of first condensation is alone used, or a method of continuous cultivation employed. In the latter process a culture of the leprosy bacillus is placed in a receptacle, in which is placed a Pasteur candle, and into this receptacle fluid from a tank of nutrient medium is allowed to slowly filter through another Pasteur candle, at the same time the fluid in the culture is also allowed to filter out through the Pasteur candle within. In this way the toxins of the cultivation are continually drawn off, and the culture is continually fed with fresh medium, so that all the bacilli remain in the culture and have continually fresh medium to feed on. In this way a culture containing a large number of bacilli may be obtained, and a stronger leprolin produced thereby.

A further improvement in the manufacture of the medium is to place the flask in which the medium is to be collected in a freezing mixture, as some of the volatile alkaloids from the beef do not condense unless a freezing mixture is used.

I am at present doubtful if the addition of alkalies to the beef is an advantage or not; it certainly produces more nutrient value for other bacteria and in this way is a disadvantage. The principal alkaloid in beef is creatine, and this, on boiling with caustic alkali, gives urea and sarcosine. I found that by passing the volatile alkaloids from beef through a bottle in an incubator, in which the leprosy bacillus had been inoculated into ordinary agar (deprived of salt by dialysis), so that the only nutriment the bacilli could have were the volatile alkaloids, that the bacillus of leprosy did grow, but very slowly.

I have had great difficulty in producing a nutrient solid medium, in which the bacillus of leprosy will invariably grow readily, and a trace of chloride appears to be fatal. The best way of making a nutrient solid medium for growing the bacillus of leprosy is to dialyse the agar cut into thin strips, by merely allowing them to soak, in frequently changed distilled water, for from two to three weeks, at the end of which time the agar is melted and tested for chlorine. At the same time the nutrient broth is dialysed through parchment paper for a similar length of time, and when all traces of chlorine are absent, the two are mixed together, and the solid nutrient medium made.

I have been able to cultivate the bacillus of leprosy from the cotton shirt of a leper, and even when strips of the shirt were hung in distilled water the bacilli were found after one month in the water in easily recognisable quantities. If cotton wool is added to the medium in flasks, and the cultivation examined in about one month, the bacilli will be found in groups inside the cotton fibres. I consider this very important, as it shows a possible means of contracting the disease, especially as we know the bacillus will grow in distilled water, and so a shirt soaked in the rain and kept damp on the body, if already infected, could easily be a source of infection to the wearer, especially if he should have some small abrasion, such as a prickly heat scratch.

The Leprolin Treatment.

On account of official reasons I have not been able to continue the despatch of leprolin to medical officers in India, but up to the time of the despatch being stopped there had been a large number of medical officers supplied in all parts of the world, and some reports of their observations have reached me, though there are a large number yet to come.

I have heard from twenty-six medical officers who have tried the action of leprolin, and detailed reports of ten cases have been received which are appended.

Sixteen medical officers, although they have not yet sent in reports, state that there has been marked improvement in the cases under their treatment.

About one hundred and twenty cases are being treated in Burma. Up to date, fourteen cases have been discharged as cured in Rangoon, and some of these cases are still being watched, and the details of these cases are appended. Of fifty-six cases now being treated by me, twenty have been under the treatment for some time and have so much improved that they may be said to be almost cured, while the remaining cases are early ones; but in every case under treatment there has been marked improvement.

I find that the order of improvement is usually—first a return of perspiration in a part previously dry, and then a return of sensation; this return of sensation may be only transient or it may be permanent; in some cases the sensation returns totally after the first injection, and then after a day or two it again vanishes in all or portions of the anæsthetic areas and returns more the next injection; but it always utimately returns on continuing the treatment. In quite a number of cases the sensation returned after only one injection and was never lost again, and in some of the cases still under treatment the sensation has returned gradually after each injection, the loss of sensation not recurring again.

The next sign of improvement is a gain of strength and loosening of the contractions of the fingers and toes; this may also return very soon, even after one injection, but usually returns later than the sensation. Cases which have had very severe deformity and loss of power through contraction have completely regained their power and lost the deformity.

Ulceration may commence healing at once and generally does, though in some cases, where there is thickened, hard epidermis around the ulcer, this has to be cut away before the ulcer heals rapidly. Fresh ulcers heal at once after injection, and the use of the salt ointment in dressing these ulcers enables one to notice how the sensation returns in them, as the patient will not complain of smarting sensation in the ulcers until the ulcers heal and the sensation returns.

Nodules are usually slow to dissappear; the hard nodules just under the skin are composed of masses of cells swollen out by masses of the bacillus lepræ, these after injection, especially in the ears, may break down and ulcerate, though this is the exception. The nodules and tubercles gradually become flattened and disappear. In one case still under treatment the patient had innumerable nodules just under the skin all over the body; these have now almost vanished.

In three cases during the course of the treatment nodules which were hard and painful appeared under the skin, but these on continuing the treatment disappeared.

The furfuraceous appearance of the skin returns later, and in only a few cases did it become normal after the first few injections.

The colouration of the skin returns slowly after sensation has returned.

The pains in the limbs, which these patients sometimes suffer so badly from, generally vanishes early in the treatment, and all cases that I have seen have stated that after the first injection they experienced a sensation of lightness of the legs and arms.

The mental condition of cases of leprosy under this treatment improves remarkably and with this the physiognomy improves, so much so that in some cases I have been almost unable to recognise the patients again.

The improvement of the general bodily health, as shown by a marked increase of weight, is also very noticeable.

Local reactions after injection vary very much; generally there is pain and swelling at the site of injection, which lasts for three days and subsides; sometimes the swelling is severe, and hardness remains for a week or more, and sometimes the whole limb becomes swollen for three or four days.

In three instances epistaxis occurred after each injection; in all these cases the nose was affected by the disease.

In places where there has been loss of hair, the hair grows again as the natural colour of the skin returns.

In the accompanying details of cases treated by me only those that have been actually pronounced as cured are cited; the other cases will be reported later, as some of them are not yet completely cured and some have not been under the treatment long.

I have given now over one thousand injections of leprolin in Rangoon and Mandalay, and in no case can the disease have been said to have been enhanced thereby, and in no case was there any bad result. In nearly all the cases the improvement has been obvious; in a few of these the improvement was rapid, but in the majority the improvement has been slow but steadily maintained; in some cases I have given as many as sixteen injections, and some cases did not show signs of improvement till after the sixth injection. In a disease so chronic as leprosy rapid improvement cannot be expected, but the readiness with which most of the patients came forward for their second and following doses speaks for itself.

With regard to the dose of leprolin and the interval at which it should be injected, the difficulty in making a leprolin of constant strength makes it imperative to increase the dose if it is not found to cause a reactionary fever of over 100°F. I have been in the habit of always increasing the dose if the reactionary fever was not marked, and the increase in the improvement of the case has always followed. The interval

between the injections has been restricted to ten days, as some few days would seem necessary to allow the patient to recover after the fever, besides which one must not expect a too rapid recovery in a disease which is so remarkably chronic. With regard to the action of leprolin, it would appear that the suddeness with which the sensation returns is a strong argument in favour of the belief that its action is not an auto-antitoxic one, but that its action is an antitoxic one.

I append the report of Dr. Brewer, the Health Officer of Mandalay, to whom my thanks are especially due for his painstaking work in carrying out the treatment at the Leper Asylums at Mandalay. My thanks are also due to the Superintendents of the Leper Asylums in Rangoon and Mandalay, and to the Superintendent of the Rangoon Jail and to Captain Williams, I.M.S., who has largely been the means of my being able to give more time to the work, and to many medical officers in this province and India for their valuable assistance. My thanks are also due to my two Burman Assistants for their skilled Laboratory work.

Reports of Cases treated by Injections of Leprolin by Medical Officers in India.

No. 1. -S. G., male, 25 years old. Duration of disease, 5 years.	Symptoms of case before injection :— Anæsthetic areas at back of right elbow, 5 in. by 3 in.; back of left elbow, 6 in. by 4 in.; right posterior axilla, 2 in. by 2 in., very extensive on extensor and flexor surfaces of both legs and on extensor surface of both thighs.	After the first injection improvement set in very soon (3 or 4 days) and continued so markedly that injection was not repeated. The salt treatment was kept up when the patient was discharged apparently cured. I. M. MACPHAIL, M. D., *Bamdah.*
No. 2.—H. B., male, 40 years old. Duration of disease 3 years.	Ulcers small and anæsthetic areas on extensor surfaces of both legs and dorsum of both feet. Also anæsthetic on dorsal surface of left fore-finger, anæsthetic patch over right eye, small tubercles on both forearms, trunk and both thighs.	Sensation returned to all anæsthetic areas, ulcers healed, tubercles diminished in size, but did not altogether disappear. Left hospital believing himself cured. I. M. MACPHAIL, M. D., *Bamdah.*
No 3.—C., age 25 years. Duration, 2 years.	Both hands anæsthetic and fingers flexed, ulcer on left index finger ($\frac{3}{4}$ in. × $\frac{1}{2}$ in.), ulcer on right thumb ($\frac{1}{4}$ in. by $\frac{1}{4}$ in.), anæsthetic ulcer on plantar surface at base of big toe.	After injection improvement set in very soon, but a new ulcer was caused by burn on the left wrist within the anæsthetic area. After the second injection the ulcers healed up completely, including the new one, with the exception of the ulcer on the plantar surface of the foot. Sensation also returned to all the affected areas, except one finger of the left hand. The remaining leprolin in the phial was therefore injected, and the patient is still under observation. The interesting observation in this case is that under the leprolin treatment, one of the local injuries which are often, I think, the origin of what we formerly believed to be the incurable ulcers of leprosy ran a natural course and healed rapidly. It is impossible to describe in precise or scientific terms the remarkable change that has taken place in all three cases, in the general appearance and morale of the patients. The dreary, dull, despairing look has given place to a much more cheerful one, and this has been accompanied by an equally marked improvement in their general condition, physical and mental. I. M. MACPHAIL, M. D., *Bamdah.*
No. 4.—K., Hindu, male, aged 50. Duration of disease, 6 or 7 years.	A few anæsthetic areas over the back, mainly inter-scapular. Small ulcers on the thumb, fore and little fingers of both hands, that on the right forefinger being recent. On the under-surface of the left heel is an ulcer, the size of an eight-anna piece. The left little finger is slightly curved outwards, and the fingers of the right hand are slightly flexed. The ulnar nerves are thickened above the ulnar notch on both arms.	He was injected at about 11 A.M., and in about two hours time the temperature began to rise until, at 7 P.M., it was 103·3° F. Pulse 110. Respiration, 42. There was some pain at seat of injection (buttock). Next day he complained of pains all over the body, and from this day onwards his temperature remained normal, and the ulcers markedly improved. Capt. ANDERSON, I. M. S., *Dubri.*
No. 5.—P., aged 32, Mahommedan. Duration of disease, not stated.	This man decamped from hospital, but returned and stated that the former injection did him so much good that he returned for another. Now all the pale patches since a month ago have disappeared. There remains now a small ulcer on the index finger of the left hand, and a perforating ulcer of the base of the left great toe. Sensation had returned on the body, but not on the patches on the arms or legs. All the other organs normal.	His temperature rose to 101·8 after injection and was normal the next day. The day after this the sensation returned in the arms and legs, except the dorsum of the feet where it was imperfect. Five days after the ulcers healed up. No other complaint except sensation over dorsum of feet imperfect. Ten days after injection patient discharged well. Much brighter and stouter. Advised to return after one month. Capt. ANDERSON, I. M. S., *Dubri.*

Reports of Cases treated by Injections of Leprolin by Medical Officers in India—(contd.).

No. 6.—A. D., aged 40; 5 years duration.	No sensation in the four limbs. Furfuraceous skin over chest, back and upper limbs. Skin over legs cracked and hard, almost like crocodile hide. Ulcer on the right foot about 1½ inch diameter. Shooting pains at night in the limbs; no tubercles.	High fever on the day of injection. Return of sensation in the limbs most complete on the second day. Ulcer of the foot looked decidedly healthy. Skin of whole body much thinner, furfuraceous appearance gone. Skin of legs almost natural. Pains in the legs disappeared and appetite improved. Feeling light all over. Slight fever of very short duration after the second injection; no further improvement. Pulse intermittent on the second day; other improvements continue.	Dr. D. C. AICH, *Mourbhanj, Orissa.*
No. 7.—N. K. T., Burman, male.	Area of anæsthesia and thickening on both malar bones, one anæsthetic patch on back and two on left buttock. Loss of hair, thickening of ulnar nerves. No ulcers or tubercles.	Temperature rose to 102°F., no great discomfort. Sensation improved at the margins of the anæsthetic patches on the face. Thickening of skin less. Sensation improved and growth of hair on the head recommenced. Improvement of sensation in patches of the face (one injection).	Capt. BEIT, I. M. S., *Toungoo.*
No. 8.—S. M., aged 25 years. Duration of disease, 3 years.	Anæsthetic areas all over body of various sizes; no ulcers. Tubercles all over the face, nose and ears.	Seven injections of 10m., 10m., 20m., 35m., 60m., 40m. and 40m., respectively, on succeeding days. Much improvement, probably cured.	Dr. H. M. CHAKRAVARTY and DR. JAMES PETER, *Mertinger.*
No. 9.—M., aged 28 years. Duration of disease, 1½ years.	Anæsthesia and tubercles all over body of various sizes; small ulcer on left leg above ankle joint.	Ulcers disappeared, tubercles are a little improved. The injections were given in small amounts on six succeeding days and after seventeen days for three succeeding days, again after fourteen days for two days, and lastly one month later.	Dr. H. M. CHAKRAVARTY and Dr. JAMES PETER, *Mertinger.*
No. 10.—K., female, aged 45. Duration of disease, 3 years.	Anæsthetic areas over a few parts of the body of various sizes. No ulcers or tubercles.	Three injections in small amounts, 20, 30, and 60m. Feeling returned in all anæsthetic areas, disease probably checked if not cured by the injections given in what might be termed the primary stage.	Dr. H. M. CHAKRAVARTY and Dr. JAMES PETER, *Mertinger.*

REPORT OF SOME CASES OF LEPROSY WHICH HAVE BEEN COMPLETELY CURED BY THE LEPROLIN TREATMENT UNDER MY CARE.

1. The first case reported in the May and June numbers of the *Indian Medical Gazette*, became completely cured and was kept under observation for three months afterwards, during which time no symptoms reappeared and the man was perfectly well and had not the slightest trace of the original disease.

2. Naranswamy (No. 2 of previous report) was discharged cured after four injections, all sensation having returned and the furfuraceous appearance of the skin having disappeared.

3. Maung Pan See (No. 3) was the most remarkable case I have yet seen. After only one injection the loss of sensation in the legs completely returned; a large ulceration of the foot, which had defied treatment for five years, healed rapidly and he was completely cured in ten days. He was seen by several medical men, and was shown at the local branch of the British Medical Association two months after, at which time he was perfectly well.

4. Ram Sandy (No. 4) after five injections, ulcerations of the fingers and toes completely healed and anæsthesia which had been present nearly all over the body disappeared completely, and he had no signs of the original disease.

5. Shwe Gno (No. 17 of previous report) had eight injections and is now completely cured. The nodules in the ears, the elevated thick patches on the legs, arms, abdomen and face have subsided, and all loss of sensation has returned.

6. Tha Noo (No. 18) has had seven injections and is now completely cured. Not only has this man lost all signs of the original disease, but he has improved remarkably in his general health. All nodules on the eyebrows, lips, ears and cheeks have subsided, and the tuberculated patches on the legs have vanished and his back

is clear. There is no loss of sensation anywhere now.

7. Nga Hein (No. 20) had anæsthetic patches on the feet, hands, legs and trunk; thick patches on the ears, nose and body. After nine injections all signs of the disease vanished. He has disfiguration of the nose from ulceration.

Of the other cases reported in the June number of the *Indian Medical Gazette*, all improved on further treatment; some prisoners were released from Jail, and the Kemmendine Leper Asylum cases were not injected again and the treatment was not continued there until quite recently, as owing to pressure of work on my hands I could not go out so far. The remainder are still under treatment, and those now in the Rangoon Jail have so much improved, that they may be pronounced as almost cured.

8. T. A. M., Eurasian, had ulceration in the right foot and complete loss of sensation around for three years, which had defied all treatment. After three injections the ulceration completely healed and the sensation returned. This man was seen by me lately in perfect health.

9. Narsiya, 40, Hindu, had been suffering for twelve years; he had raised patches on the face and eyebrows and white anæsthetic patches all over the body, short thickened toes and fingers. After four injections the patches on the face vanished and the loss of sensation in the anæsthetic patches completely returned, and they assumed their natural colour.

10. Narranium, Hindu, male, two years' duration. Had complete loss of sensation in the legs and anæsthetic white patches on the body and a large anæsthetic white patch on the right shoulder. After three injections the sensation completely returned and the colour of the patches became normal.

11. Ramyah, 40, one year's duration. Had complete loss of sensation in the legs and ulceration of the buttocks and thickened toes. After two injections the sensation completely returned, and the ulceration healed up.

12. V. P., Eurasian boy aged 13, had complete loss of sensation in both legs, more especially in a large white patch on the dorsal surface of the left leg and foot, and a few patches about the body and on the arms.

After each injection the sensation returned, commencing at the edge of the large white patch, until after the fifth injection it had completely returned.

13. R. P., Brahmin, had loss of sensation in white areas on the left elbow and legs and thickening of the cheeks and eyebrows. After three injections the sensation completely returned, and the natural colour of the skin became normal.

14. S. H. M., Brahmin, had tubercular raised anæsthetic patches on the eyebrows, which subsided, and sensation returned after three injections.

A SHORT ACCOUNT OF THE VARIOUS TRYPANOSOMATA FOUND TO DATE IN INDIA IN THE BLOOD OF SOME OF THE LOWER ANIMALS AND FISH.

BY A. LINGARD, M B.

As in several publications which have recently come under my notice, it has been mentioned that but little is known concerning the Trypanosoma of Surra and other varieties of these organisms found in India, I think it would be advisable to enumerate the various forms of trypanosomata observed in this country up to the present in some of the lower animals and fish, waiting for more elaborate descriptions in those cases in which they are necessary, until such time as it may be found convenient to publish my notes *in extenso*. Some of these, however, bearing on the life-history of Surra and Dourine are now in the press. The order as to the dates on which the different Trypanosomata were observed was as follows:—

1. *Trypanosoma Lewisi*.[1] This organism, the special parasite of rats, was discovered in the blood of these animals in 1877 by T. Lewis, not only in the plains of India but in the hills also. Lingard observed the organism of Lewis in the blood of a bull several days after the subcutaneous inoculation of the same with infective rat's blood.

V. Carter, and later the author, found the trypanosoma in the blood of monkeys, only on the second and third days respectively, after inoculation with infective rat's blood. Lingard also observed the Trpanosoma Lewisi and the Trypanosoma Evansi concurrently developing in the blood of a rat (m.d.), and further he maintains that at times in certain parts of India the blood of the rat (m.d.) may and does contain at one and the same time more than one variety of trypanosoma. Of 12 horses isolated from other animals in a district where Surra was not enzootic, injected subcutaneously with rat's blood containing hæmeltozoa, four developed trypanosomata in their blood, and all succumbed, 3 in 2, 2, and 5 days respectively.

2. *Trypanosoma Evansi*.[2] Discovered in 1880 in the blood of equines, mules and camels by Griffith Evans. This organism proves fatal to the great majority of animals except bovines and a small percentage of camels. But buffaloes in the cases experimented on (by Lingard) succumbed to the effects of the organism within 120 and 46 days respectively.

Trypanosoma of Camel. It is probable that the organism found in the blood of spontaneous

[1] XIV Annual Report of the Sanitary Commissioner with the Government of India.

[2] Evans. G. M: D. "Report on Surra disease in Dera Ismail Khan" Military Dept. No. 493—4467.

Surra in the camel, is identical with the Trypanosoma Evansi. However, it is relatively larger in size than that found in the blood of equines. When inoculated into country-bred ponies, it produces the well-known paroxysms and intermissions for a period only. A pony which was inoculated in March, 1902, and has been under daily observation since, is now in apparently perfect health. In the blood of this animal the trypanosoma has not been discovered microscopically for a period of over seven months. This animal will be inoculated with virulent Equine Surra in order to test whether any protection has been afforded from the camel trypanosoma.

3. *Giant Trypanosoma of Bovines.*[1] Discovered by Lingard during 1892 in the blood of bovines inoculated in the first instance with equine surra blood, and later with blood derived from equines which had been primarily injected subcutaneously with the blood of rats (m.d.) containing the Trypanosoma Lewisi. These organisms, as their name indicates, are very large, their length varying from 20 to 22 times that of a red blood corpuscle.

4. *Trypanosoma of fish.*[2] Several varieties of fully developed trypanosomata varying considerably in size were discovered by the writer during 1891-93, by gently scraping without drawing blood, the external surface of the gills of recently caught fish. The fish were obtained from the river at Poona towards the end of the hot weather, when the water was at its lowest and concentrated. In every instance the most marked development of the undulating membrane was observed. The species of fish which gave the best results were the *Barbus Carnaticus, Ophiscephalus Striatus*, and the *Ryncobdella aculeata*. These trypanosomata must not be confused with those found in the circulating blood of the same fish, which belong to a totally different species.

In addition, numerous observations were conducted during 1896-97, with regard to the various species of trypanosomata discoverable in the blood of fish obtained from the Jumna river and backwaters. Two species of trypanosoma were observed, one a large variety of hæmatozoon and the other a very small one.

The former was frequently present in the circulation of the Grisauli or Girai (Punj.) Murral (Hind), species *Ophiscephalus Striatus*. The latter in *Cachri* or *Chachari* (Punj.) genus, *Trichogaster* closely corresponds to *T. faciatus*, and *Singili or Tingli* (Punjab) genus, *Macrones*, Species *M. Seenghala* or *M. Tengara*.

Of fifteen Cachri examined, one exhibited over 200,000 of the small variety of hæmatozoon in each c.mm. of blood submitted to examination, while in the blood of the remaining fourteen, in only one was the trypanosoma absent.

No hæmatozoa were found in any of the following specimens:—

Pattia (Hind), *Barbus stigma.*
Mohayalee (Hind), *Labeo diplostomas.*
Putti (Punjab), *Notopterus kapirat.*
Kugga (Punjab), *Clarius magur.*
Rewa (Hind), *Cirrhnia reba.*

Failure to reproduce the organisms by inoculation in animals, whether from the outside or from the circulation of fish, always followed.

5. *Trypanosoma bandicotti.*[3]—The organism discovered in the blood of *Mus (Nesokia) giganteus*, was found by the author in 1893. Of 150 bandicoots examined in Poona, the blood of 38 contained the organism. The trypanosoma was present in the circulation of young and half-grown animals of this species, but was almost entirely absent from the full-grown animals examined. It was capable of reproducing itself in the blood of guinea-pigs when injected subcutaneously, and later of bringing about fatal results. The same organism appeared to be innocuous to the mule and ass. The *Lewisi* is incapable of reproducing itself in guinea-pigs. It is of interest to note in view of Schaudin's[4] remarkable discoveries, that many small animals, inoculated with bandicoot blood containing large numbers of trypanosomata, succumbed in the course of some weeks. For some days previous to or on the day of death, spirilla were found, although the trypanosoma might never have been observed at all. One variety of trypanosoma observed in the blood of the bandicoot resembled somewhat a long narrow leaf in form.

6. *Trypanosoma of Plains Bovines.*—Discovered by the author[5] in the blood of large Ferozepore bullocks at the Government Remount Depôt, Karnal, in December, 1895, during an outbreak of Surra amongst country-bred Remounts. The trypanosoma only observed in the blood of two bullocks, was considerably larger than the *Evansi*. One animal succumbed within 24 hours of the diagnosis being made, while the second passed through a paroxysm of high fever, due to the organisms of two diseases (Trypanosomiasis and Filariasis) being present concurrently. This trypanosoma may be similar to the one described by Theiller in South Africa, but the outbreak, it must be remembered, was co-existent with Surra in equines. The *Evansi* is not fatal to bovines, although it is to buffaloes.

7. *Trypanosoma of Hill cattle.*—This trypanosoma was discovered on 6th June 1902, by

[1] Surra Report, Volume II, Part I, page 88, and Centralblatt fur Bakteriologie (Original), Bd. XXXV, S. 234.
[2] Centralblatt fur Bakteriologie, Bd. XXXV, S 237.
[3] Annual Report of Imperial Bacteriologist, 1895, and Surra Report, Volume II, Art. II, 1898, pages 201—205.
[4] "Generations and Wirthswéehsel bei Trypanosoma and Spirochaete." Von Fritz Schaudin. Arbeiten aus dem Kaiserlichen Gesundheitsamte Zu, Berlin. Vol. XX, part 3, 1904.
[5] Lingard, Report on an outbreak of Surra and Filariasis at Karnal Depôt, 1895.

the author in the blood of a hill bull, just before death, which succumbed to anthrax at Muktesar, elevation 7,600 feet. Only one trypanosoma was found. This animal was brought from the valleys bordering upon the foot of the snow mountains. This is the first time a flagellate protozoon has been found in the blood of Hill cattle. The trypanosoma above mentioned and numerous anthrax bacilli were present in the same specimen of blood. The length of the trypanosoma in question was equal to 13 times the diameter of a red blood corpuscle, and the width of the widest part to the diameter of 18 corpuscles. The flagillum was fairly short, the posterior extremity prolonged as in *Lewisi*. The undulating membrane was only moderately developed. The micro-nucleus and the macro-nucleus were both undergoing division, the position of the former was at the junction of the anterior 5/6th of the body, with the posterior 1/6th of the hæmotozoon.

8. *Trypanosoma Equiperdum.*—(Doflein). This organism was recognised for the first time in India, in the blood of a Dourine affected horse by Pease[1] during 1902.

Lingard[2] has presented a report to Government detailing the life history of this organism.

THE PATERNAL *versus* THE COMMON SENSE PLAGUE POLICY. *

BY W. G. KING, C.I.E.,

LT.-COL., I.M.S.,

Sanitary Commissioner, Madras.

SOMETIME back, a series of articles appeared in the *Pioneer* under the "nom de plume" of "Redcap" on the subject of plague which attracted considerable attention. I have been asked by more than one enquirer why I have not advised adoption of the common-sense principles therein advocated. Personally I found the articles most interesting; but in spite of the comforting monopoly assured by the title to this special policy, I have not felt justified in accepting the principles advocated. Why I have not done so I propose to lay before you, with, I am afraid, the somewhat selfish object of eliciting your opinions; so that my own judgment may either be strengthened or rectified.

The "common-sense policy" is founded on the theory that the only way to deal with an ignorant population is by allowing it to be taught by experience; that is, "Redcap" trusts to the people's common-sense coming to their rescue when they have been bitterly punished as a result of their ignorance. He would teach the child to avoid the fire, by allowing it to burn itself. He would allow any one to acquire or distribute to others plague infection *ad libitum*, until, in despair, the masses would combine to enforce methods that Hygiene would dictate. Now experience is a magnificent asset to be possessed of, if it be not bought in too dear a market. But, unfortunately, "Redcap" assigns no period when his educational measures would produce the desired end, and ignores inimical results to surrounding provinces, and to trade with foreign countries, which the adoption of such a policy by any local Government would bring about. When people have been sufficiently tired of their experience he would build for them a system of surveillance, which would embrace the giving of information to uninfected areas of the departure of an individual from an infected area. Such a method would grow and be enforced largely by the voice of the people, and when its rules were broken legal punishment would follow not on the complaint of officials, but of the individual who imagined himself to be injured by the importation of plague. Irrespective of the cruelty of a Government neglecting its paternal care implied in the adoption of the burning-of-the-child-policy, it seems to me that there is here a decided flaw in "Redcap's" reasoning, and if it be true that this flaw exists, it is certain that the policy which depends upon it is cruel and wrong. There cannot be the slightest doubt that however much it were preached that a prosecution of the nature he defines was made at the hands of non-official representatives of the Indian people, none but the more highly educated classes would ever appreciate the fact that the motive power was not that of the Government, which is the very conclusion he would wish them to avoid. At the best, the action "Redcap" contemplates would be taken by a mere fraction of the people during an indefinite, and certainly prolonged, period; yet protection from plague is in proportion to the completeness and rapidity of application of any system adopted for its resistance. No one would dispute that the end sought to be subserved by "Redcap," namely, the attainment of an appreciation by the people of the danger of neglect of sanitation fighting with a deadly disease, and of the necessity of substituting for passive or active resistance of the philanthropic efforts of Government sensibly sustained efforts at self-preservation is desirable. But if it be possible to secure sanitary ends without Government forsaking its correct parental relation to the people, and without a preliminary burning of its children, why need action be deferred to secure a result that is problematical, and, at the best, is indefinite as to the period when its influence could be felt?

Cannot the education of the people and their acceptance of sanitary requirements be obtained without the preliminary burning of the child? Madras experience shows that this is so. The policy of surveillance which, in the closing part of the pamphlet, "Redcap" so earnestly advocates has, under the name of the "passport system" in this Presidency proved a trustworthy method of education of the people. From the moment it was understood that plague was prevalent in Bombay, in October 1896, a voluntary system—for there yet was no legal power to enforce it—was adopted in respect to all passengers from Bombay. They were inspected at Adoni and Guntakal Railway Stations, and by guards of the trains carrying them intimation was sent to Madras City of their names and addresses; arrivals in mufassal municipalities and local fund areas were notified to local authorities, by men deputed for the purpose at Railway Stations. As soon as powers were obtained under the Epidemic Diseases Act, this method was extended by the appointment of local authorities in every town and village throughout the Presidency, before whom all arrivals from infected areas were bound to present themselves for ten days with the object of ascertaining their state of health. Now this system gives to the people absolute freedom. The man from an infected village probably receives a less genial welcome than one from an uninfected area is likely to secure; but he nevertheless, under a parental system which recognizes the freedom of the subject, has the right of entry so long as he is not a positive danger to the community. It is true that if the law is sinned against, prosecution follows: but this, as it should be, is conducted by the State, which is usually

[1] Pease, Report on Dourine, 1903.

[2] Report on Dourine in different breeds of Equines, etc. with 16 illustrations, March 1904.

* We think this paper so important that we reproduce it from the *Transactions of the Madras Branch of the British Medical Association.*—ED., *I. M. G.*

held to be impartial; instead of by various individuals (as "Redcap" would advocate) who would more probably be actuated by a desire to pay off old scores against neighbours than by the higher motive of the public good. Moreover, it would strike most that if so simple a law were sinned against, punishment is well merited. The perfection of surveillance thus secured, doubtless varies in accordance with the personal equation of officials in various parts of the Presidency. In uninfected areas, necessarily (and luckily therefore without materially detracting from its efficacy) it works better than within infected areas, presumably as a simple result of the numbers to be dealt with. The organization working on this system is more perfect and reliable within municipal, than in rural, areas, and this probably explains a contrast in the experience of "Redcap" as compared with that of this Presidency. He speaks of plague as a disease of towns and looks for extension thence to rural areas; whereas, in Madras, our rural population, having borrowed plague from the over-infected area of Mysore, pass it on to the towns, which are usually the last to suffer in indigenously infected districts. How perfectly the system of surveillance can be worked even in towns containing half a lakh of people may be estimated by the fact that in the City of Madras last year less than two per cent. of 79,488 passport-holders from infected areas escaped surveillance. Now "Redcap's" highest ambition is that, as a result of the burning-the-child policy, the villager should learn to keep arrivals from infected areas outside the village. On the contrary, as already stated, the passport entitles the holder to enter any inhabited area he chooses; yet, village communities do at times take the law into their own hands, and show that they have received their education in the direction "Redcap" desires by forbidding their entrance. So that if this be the summit of his ambition, again, it is evident, the desired result can be secured without Government forgetting its position of parent to the people. Personally, I consider a policy of allowing the people to exercise quarantine is absolutely erroneous, in that it tends to concealment of plague, evasion of surveillance and rioting: but it is one of those things one may safely forget to see where petty villages are concerned. But in the Punjab, this method was legalized in October 1902. Writing on the 9th March of this year, the Lieutenant-Governor of the province refers to this effort towards entrusting the law to the people thus: "There is evidence to show that the people are occasionally disposed to keep suspected strangers out of their villages, though they have not yet been able to act with sufficient determination or combination to do so successfully." Obviously, the education of the people, to which "Redcap" trusts, is a very slow matter; and I would particularly invite attention to the reported want of "combination," or, in other words, the absence of that natural resultant of "public opinion," for the growth of which he would plunge the people into the horrors of unrestrained plague. I may say here in parenthesis that public opinion of the nature "Redcap" relies upon is an European exotic that, I found long before plague appeared in our midst, cannot grow rapidly in the country. The people can be made to act as a mass under correctly or incorrectly interpreted religious theories: but these do not appeal to the calm discretionary instincts that would alone serve "Redcap's" purpose. It was once a favourite idea of my own that given a number of educated men in a neighbourhood they could insist upon at least common decency being observed. I now know better. Any one who has an inkling of the many factors upon which *real power* in native life depends will understand why they should be so and will agree that public opinion of the type "Redcap" hopes for cannot be expected for several generations. He has erroneously applied European deductions to conditions of Indian life.

While the common-sense policy relies upon the cruel and financially unsound measure of abandoning the people to the consequence of their ignorance, the parental policy aims at securing their co-operation by making them feel that the discipline required is in their own interests. *This they are taught by their seeing, in practice, that each legally enforced measure does not press upon personal liberty one* iota *more than is necessary to secure the sanitary end in view.* It is, I believe, the careful observance of this condition that has enabled the Government of Madras to put in force reasonably effective measures without encountering the extraordinary opposition experienced in other Presidencies; though doubtless, it has been aided by the better grade of education to be found in the south of India than in other parts. That there is room for "Redcap" to enunciate his policy at all is due solely to the fact that the measures undertaken at the origin of plague, in certain parts of India, were such as to inevitably lead to its being understood by the people that the Government was determined to effect its purpose, without the slightest consideration of personal liberty. A year before the entrance of plague to India, who could have conceived it possible that the Government of Bombay would cause British soldiers to enter into caste native houses in search of the sick, or would have proved so thoroughly antediluvian in its sanitary ideas as to attempt a huge, expensive, and, necessarily futile, system of land quarantine? Here and there, "Redcap" makes a little pin prick in the pachydermatous tissue of sanitarians and medical men, as if with them rested the origin of these impracticable measures. But it should never be forgotten that methods curtailing personal liberty that were originally adopted in Bombay, and were imitated more or less in parts of India other than Madras, were not due to the initiative of medical officers and sanitarians in the service of the Government of India. In their wisdom, the Governments of India and of Bombay looked upon locally obtainable advice as unworthy of consideration, and imported "experts" from "Hongkong". Now, whatever may have been the merit of these officers' knowledge of plague, they were obviously absolutely ignorant of the customs and susceptibilities of the natives of India, and the policy which resulted from their indiscreet suggestions was, to say the least, pitiful. The native felt that the vigorous measures applied were in excess of requirements of the case, and consequently were unjust. Now in meting out discipline to a child there is nothing that breaks its heart so much as treatment that, in its little judgment, is unjust and beyond the necessities of the case. Equally, to the educated native of India the necessity for severity is alone comprehensible when it is tempered with moderation and justice. Luckily for Madras, its Government had the discretion to spare this Presidency the infliction of the quarantine measures strenuously advocated by the "expert," who was duly deputed by the Government of India, to afford it guidance. I have never heard that the "expert's" feelings were in the slightest degree hurt by the incident: but he was probably not inconsolable—he drew a salary that prevented effectually a disturbance of professional equanimity.

But the passport system is by no means the only part of the parental policy that has educational results. "Redcap" very sensibly pleads strongly for the employment of special plague staffs, and deprecates the use of Revenue officers, who have already their hands full of work. He would have, both in rural and urban areas, staffs specially detailed for this public duty. These he considers would, after he had let the people be punished for their sins of ignorance, secure the confidence of the people, and make them see the necessity for sanitary action. Now, whilst the Madras policy runs side by side with that suggested by "Redcap" in respect to choice of special staffs and the reaping therefrom of educational results, it differs radically as to the time chosen for the employment of his educational method. Perforce, "Redcap's" efforts must be always

in the direction of mitigation of existing epidemics, because he deliberately allows plague to enter into a locality and then takes action. This, however, is precisely the reverse of what has been adopted in Madras. Whilst, in all towns and districts not by reason of their proximity to infected areas specially in danger of invasion, it has been held sufficient to detect the importation of plague cases by means of the passport system, over areas imminently threatened a complete net-work of so-called "observation circles" is thrown. In rural circles, each ten miles of the threatened area is placed in charge of a mounted Sanitary Inspector, and over every four circles constituting a Division a mounted plague supervisor. In towns each 12,000 houses is placed in charge of a special Sanitary Inspector, plus a supervising Divisional Sanitary Inspector for each three such circles, irrespective of the permanent staff of the town. In both rural and urban areas, on occurrence of plague within them, the circles are divided by one half so as to secure better supervision. Completely separate organizations are found for disinfection duties, so that the observation staffs should proceed steadily upon the duties of watching the working of passport rules and discovering imported cases of plague, without their time and attention being devoted to work of the nature implied in systematic disinfection ; so that, by prompt sanitary action and urgent disinfection, no indigenous spread need occur. These men with their attached menial and disinfection staffs are worked directly under the Collectors of Districts, whose Revenue staffs are supplemented if necessary. Now Madras, before the appearance of plague in Bombay, had available a large body of well-educated certificated Sanitary Inspectors. Their numbers have since been increased by the use of men specially selected, trained and examined solely in reference to plague and known as Temporary Sanitary Inspectors. Over 65 per cent. of these men are Brahmins, and the rest are nearly all of the higher castes of Sudras and Mohamedans. Now practical experience shows that, when staffs of this nature are thrown into a district *before the advent of plague* on observation duty, they are able to come into actual contact with the people without offence to caste prejudices and discuss with them, with conviction founded upon theoretical and practical knowledge, plague policy and the honesty of the intentions of Government. These men are in daily contact with the headmen and influential villagers in rural parts and with men of leading in towns ; and, although Revenue prejudices are strongly against them, I consider it is impossible to over-estimate the value of services rendered by them in the past in the direction of educating public opinion irrespective of their value in supervising and checking the working of the passport system, checking death causation and registration and improvement of the general sanitary conditions of villages. By means of this staff aided by the passport system, it is possible for District authorities to detect and take instant sanitary action in respect to the segregation of imported cases of plague. It can be quite understood that working *behind* an epidemic after "Redcap's" method, there might be failure to secure evidence of cases of imported plague until the burning of the child had taken effect even with the staff described ; but by working in advance of an epidemic not only is the educational effect he desires obtained, but the willingness to disclose cases must be greater where first imported cases are dealt with than where in towns plague has become indigenous, and the interests of not one but many of its inhabitants are involved. Surely, this is a gentler and more rational method than to permit the establishment of plague, and then to seek to trace people who have bolted from infected villages, as advocated by "Redcap," in enunciating the necessity for a surveillance system.

With one exception (disinfection) from this point forward, the management of plague by the parental is literally the same as the common-sense policy. Imported plague cases and their contacts only are segregated and although Collectors of Districts differ in their methods (for example, in the Nilgiris extensive evacuation being impracticable, removal of the sick to hospital was maintained) the Government of Madras definitely ruled a year back that the moment plague was declared indigenous, the segregation of contacts should cease. Home treatment of the patient is *allowable*, where the dwelling is suitable and sanitary care is feasible. Under a still more recent ruling contacts of imported cases are not segregated, if their sanitary care and surveillance can be effected without fear of their bolting. When plague is indubitably indigenous, each contact is provided with a "contact pass," and is required to present himself once daily for surveillance, whilst at liberty to pursue his ordinary work. Medical treatment is forced upon no one. Evacuation and disinfection is then held to be the sheet anchor. Standing camps for evacuated inhabitants of which "Redcap" has such a horror are not erected. All persons able to camp on their own ground and buy their own material are allowed to do so. Sites are selected for those only who are not in possession of ground, and material is furnished in cases of proved poverty. In dealing with the matter of evacuation, Madras has gone one better than the radical policy advocated by "Redcap." The paternal policy has in this respect a logical sequence. To render of utility the fact to which "Redcap" alludes of the slow spread of plague when first affecting a town, I have advocated not to dawdle whilst the inhabitants of the infected block wonder whether they dare leave their property, or face the loss of employment which would be so brought about. I have suggested that the whole problem of protecting property and of compensating for losses of evacuation *of the first infected block of a town*, should be undertaken by the public body concerned. I hold seeing that the spread of plague from an infected block in a town is usually slow, that this policy would be financially sound, *if it secured early and rapid evacuation*, although it might be safely condemned as impracticable, when not contrasted with the results that follow futile temporising in the hopes that the inhabitants would evacuate from *fear*, "Redcap's" panacea.

I have said that the principles of disinfection form an exception to the concurrence of the parental and common-sense policy. To leave this to voluntary action is the worst feature of the burnt-child system. There is indeed in this respect involved a flaw in his system that "Redcap" does not seem to see. So long as the importation of a single case of plague implies the possible, although slow, infection of huge areas of towns and countries, and so long as human infection represents an agent of spread, over which there may be some control, and the problem is complicated by the fact that a single such importation may mean an epizootic amongst rats over which practically no control is possible, it is apparent that the education by the burnt-child-policy may, in consideration of the peculiar impossibility of securing uniform opinions and actions in races and castes so divergent in interests and language in this country, result in ever-recurring epidemics ; albeit that "Redcap" defends his system by suggesting such epidemics would be limited in nature. It is obvious that, having regard to these divergent conditions which cannot be lightly ignored, no opinion as to *when* this radical change of mental attitude of the uneducated masses as a result of this burnt-child's policy would occur; so that, looking at it in its most favourable light, it seems to me that if human life is of value as a matter of political economy, and if trade is a factor in the prosperity of India, a policy that would advocate letting plague "rip" until the people help themselves is unsound, however plausible the practical facts from which this deduction is attempted may be.

It is certainly calculable that the burnt-child-policy will make a certain number of converts, and that especially the advantage of early evacuation will gradually become recognized by Hindus, whose Sastras

fully recognize its necessity. Therefore, whilst as already pointed out, practical experience in Madras has shown that it is possible to give to the people the utmost possible relief from restraint of personal liberty by the use of the passport system, and, by systematic surveillance of the populations *before the advent of plague*, to educate them to a standard rendering them capable of appreciating the parental method of Government, it would seem essential that on the one point of disinfection volition should not be left to the plague sufferer. So long as it is held dangerous to human life to store gunpowder or kerosine oil in bulk close to human habitations, so long it must be insisted, by exercise of the authority of the State, that no one shall be allowed to store infective material within dwellings to the detriment of his fellow inhabitants. Compulsory disinfection by no means implies a restraint to personal liberty—a form of compulsion which should be avoided at all costs. Hence this important point of policy in Madras is practically, in the presence of indigenous plague, the only matter where compulsion is strenuously enforced. But even here by exercise of tact and perseverance education can be given and taken advantage of. However much the process was at first disliked as a result of suspicion and ignorance, it is rarely that the efficacy of disinfection is, at the present time, really questioned in this presidency. I have seen disinfection gangs composed of a poor and uneducated class of natives, insist upon bathing their whole bodies and clothing with the perchloride of mercury solution. Indeed, perchloride of mercury solution must, in some localities, be kept carefully under lock and key else it is liable to be stolen; whilst the voluntary offering of houses for disinfection is by no means rare. To abandon the right to insist that infective matter should not be stored to the danger of community would be pusillanimous, and unworthy of the parental position of a Government.

I fancy that this question of what should be the correct policy in combating plague in India would not be so much in evidence, were it not that the various Governments have felt in despair at the amount of money that has been spent without apparently getting rid the disease, whilst appalled by the fatalistic theory that plague is subject to recrudescence, and that once it has been introduced into a locality, nothing short of a cycle of years will get rid of it. To accept this theory of recrudescence is to deny the value of any sanitary measures beyond effecting palliation. To get rid of the theory of recrudescence, would mean the attacking of the problem throughout India with infinitely more energy than at present.

Since this was written, I have seen it stated that plague has killed off so many men in the prime of life in the Punjab that this factor is likely to effect seriously both recruiting for the Army and Agriculture. To my mind, the nonchalance with which in this Presidency the question whether the present rate of expenditure is worth the candle is discussed, is characteristic of a Public which has never taken the trouble to imagine what plague could accomplish in this Presidency, were it left untrammelled. In short, I think experience will show that the common-sense policy of uncontrolled plague is a very expensive luxury for a community to indulge in if they depend upon trade for their living, or for a Government if its existence depends upon finances derived from taxation. Plague cannot be got rid of by pursuing the policy of the ostrich. It is a disagreeable matter that must be tackled, and the sooner and more completely it is met on correctly organized lines the better for the financial welfare of India. Prejudices and conservatism not only of the people of the country but also of many highly educated members of the European community will delay the consummation, and many futile compromises will accordingly be attempted by the various local Governments; but it takes no gift of prophecy on my part to foretell that ultimately, when all concerned have earned that experience upon which "Redcap" places rightly so much confidence as a factor in sanitary education, it will be found that both sound sense and common sense dictate the necessity for the formation of a properly organized and equipped permanent Public Health Service for this country, which shall grapple not only with plague but also with other preventible diseases that are not prevented.

PLAGUE IN FEROZEPORE, 1904 (WITH SOME DEDUCTIONS AS TO THE NATURE OF PLAGUE).

BY L. B. SCOTT, B.A., M.B. (CANTAB.).

LIEUT., I.M.S.

PLAGUE was declared in Ferozepore Sadr bazaar on March 9th. It continued till the middle of May, deaths (often as many as 8 per diem) occurring every day.

On March 18th the first case occurred in the part of cantonments inhabited by Europeans and Native troops, and it is with this part of the outbreak which this account deals. It affords valuable material for the reason that it occurred entirely among soldiers, followers, or servants of officers who were all under the medical observation and sanitary control such as is impossible in the case of Native civil communities.

The following separate outbreaks having no apparent connection with one another occurred in cantonments apart from the Sader bazaar:—

Outbreak I is described in the accompanying scheme which shows the geography of the compounds and cavalry lines in which it occurred and the manner in which it spread from one dwelling to another. It started in a bungalow shared by the medical officer and three other officers of the 7th Lancers, among whose servants alone 13 cases occurred. It necessitated the sending into camp of the whole of the 7th Lancers.

OUTBREAK II IN THE TRANSPORT LINES.—*13th April*—One human case of plague. The medical officer on visiting the lines obtained a history that on the same morning in two quarters in a separate block of buildings from that in which the case occurred a dead rat had been found, and living rats had been seen running about excitedly in unusual numbers. These quarters with that of the patient and those beside and behind them were at once vacated, disinfected and unroofed.

April 15th.—Every one of the inhabitants ofthe quarter where the rat phenomena occurred developed fever, *viz.*, six men.

April 16th.—The medical officer on visiting the followers' hospital in the morning found two of these men lying dead in the verandah, a third with bubonic plague, and the remaining three with high fever. With a syringe he extracted a drop of blood from the spleen of each corpse and made films which, after staining, showed swarms of typical plague bacilli under the microscope. The remaining four cases were at once removed to the plague hospital and all developed bubonic plague. The whole of the transport lines were evacuated, the occupants encamped and arrangements made to unroof all the buildings.

April 19th—Two cases of plague. One of the patients lived in another block of buildings from those already infected. The other had not lived in lines at all, having been camped out at a distance with some bullocks sick of foot and mouth disease. On April 13th he came into lines to get some clothes out of the quarters where the rat phenomena occurred when these were being emptied. It appears that he contracted plague either by simply entering these rat-infected quarters or by contact with the rat-infected clothes.

April 20th.—One case of plague in a woman. For five or six days after the evacuation of these lines 50 to 60 dead rats were found every morning by the disinfectors, and on one morning 110 were counted.

Outbreak III.—On April 20th one case of plague occurred in the Ordnance lascar lines. Searching enquiry could elicit no evidence as to dead rats or other unusual phenomena among rats having been observed. The patient's quarters and those adjacent to it were vacated and disinfected. No second case of plague occurred

Outbreaks IV, V and VI, in bungalows 11, 117, and 119. A single case occurred in each of these bungalow compounds at various dates. The sources of infection were undiscoverable. Presumably the patients caught plague in the Sadr bazaar or some village. No rat phenomena occurred and no second case of plague in any compound.

Outbreak VII.—In bungalow 21 a Mali developed plague who confessed to having been in a village where plague was prevalent a day or two before he was taken ill. No rat phenomena and no second case of plague occurred.

Outbreak VIII.—In the servants' quarters of No. 82 bungalow one dead mouse was found, in which plague bacilli were demonstrated microscopically. The particular quarter was uninhabited, there being only one servant at the bungalow who lived several quarters away from it. No human case of plague occurred. This bungalow is close to the Sadr bazaar.

The bearing of the above facts upon and commonly held opinion as to the following questions will now be discussed

Source of human infection.
Source of infection of rats and mice.
Spread of infection from place to place and house to house.
Nature of plague in the light of the analogy of other diseases.
Prevention of plague.

SOURCE OF HUMAN INFECTION

The possible sources of infection of man are—

(*A*) Infection from previous human cases.
(*B*) Infection from plague stricken rats and mice.
(*C*) Infection from external objects.

EVIDENCE FROM THE ABOVE OUTBREAK AS TO

(*A*) *Infection from previous human cases.*—No single case in this epidemic can be shown to have contracted plague by this means. On the contrary there are several facts demonstrating clearly the non-infectivity of plague from man to man, thus:—

(1) In the plague hospital there were two or three healthy attendants on each case of plague, since as a rule the patient's whole family accompanied him when sent to the hospital. These people remained constantly in the closest possible contact with the plague cases, sitting on their beds, holding their hands, fanning them, &c. Yet not a single fresh infection occurred in the hospital.

(2) Among the camped out occupants of infected dwellings several fresh cases occurred during the first four or five days, and one or two up to the ninth day after removal from the houses, but after this period plague ceased among them. These cases failed to infect any fresh individuals of their families although often living in the closest contact with them in diminutive tents and huts

(3) In all the dwellings where a human case of plague occurred with no infection of rats no second case followed. These single cases having probably become infected in some bazaar or village, on returning home and developing plague were apparently no source whatever of danger to their households.

(4) In No. 40 bungalow where many successive cases occurred, the second crop of cases appeared not to have been infected from the first case, since it is highly improbable that three cases simultaneously would have such an unusually long incubation period as seven days

(*B*) *Infection from plague-stricken rats and mice.*—There are several facts tending to show that this was a frequent mode of infection.

(1) The first sign of plague in No. 40 compound was the finding of dead rats. Three days later a human case occurred. This being an usual incubation period, makes it appear that the patient was infected directly from, the diseased rats.

(2) In the 7th Lancers lines dead rats were first found, and three human cases followed in two days (usual incubation period) close to where they were found. The sweeper who came to remove these rats developed plague four days later.

(3) In the Transport lines, a dead rat and unusual behaviour of living rats were observed one morning in two adjacent quarters. Two days later every inhabitant of these quarters (six men) developed plague. This again looks like direct infection from rats and is in marked contrast to the sequel of the human case occurring on the same morning in another part of the lines which was *nil.*

(4) During the outbreak seven rats and mice probably dead of plague were carefully dissected and examined microscopically. In three plague bacilli were found in all the organs. In three putrefactive bacteria precluded the finding of plague bacilli if present. In none were buboes found. They had apparently all died of septicæmia. The inference that plague is usually septicæmic in rats explains this apparent greater infectivity, on the ground that bacilli can escape from their bodies in much greater numbers than is possible in the usual human form of localised bubonic plague.

(*C*) *Infection from external objects.*—The only clear case is that of the outsider who came into the transport lines to remove some clothes from the quarters where rat plague had occurred, and developed the disease six days later. It appears more probable that he contracted plague from the clothes than from the house, since, if infected by the latter, his incubation period was unusually long. It is probable that many of the cases in this outbreak were infected from their houses, especially in No. 40 compound. Since all occupants were at once turned out of infected houses there was no opportunity for observing the prolonged house infection so often seen in plague. No cases have followed the return of the inhabitatis which, however, took place after the plague season was over.

OTHER EVIDENCE AS TO SOURCE OF HUMAN INFECTION.

It was concluded by the Indian Plague Commission[1] and is generally acknowledged that ordinary plague is not infective from man to man, but that infective cases do occur and, on occasions, intensely infective outbreaks of pneumonic plague. The commonly accepted reason for the non-infectivity of human plague is that, as a rule, the bacilli are not free in the blood, and hence have little chance to escape from the body.

The Indian Plague Commission,[2] though giving many instances of direct infection of man from rats, conclude that this method of infection does not play an important part as a source of human plague. They state[3] that buboes are found in only a certain proportion of rats, thereby inferring that the septicæmic form of plague is that from which rats usually suffer. There is three for the reason given above an *à priori* supposition that rats should be far more infective than man when suffering from plague.

The Indian Plague Commission[4] concludes that far the most important source of human infection is external objects, particularly in contaminated houses, but also clothes, merchandise and grain.

SOURCE OF INFECTION OF RATS AND MICE.

This may be discussed under the same three heads.

(*A*) *Infection from human cases.*—There is no evidence to show that this often occurs.

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[1] Indian Plague Commission's Report, paras. 198—214 & 230.
[2] Do. do. do. do. paras. 215—217.
[3] Do. do. do. do. para. 184.
[4] Do. do. do. do. paras. 218—229.

(*B*) *Infection from plague-stricken rats and mice.*—In the Ferozepore outbreak, from the very rapid way in which plague spreads among rats and mice it seems almost certain that the chief method of infection was a direct one from individual to individual. Especially in the Transport lines where enormous numbers of rats died within a few days of the outbreak of plague, it is impossible to explain the rapid spread by any other means of infection.

That plague is intensely contagious among mice has been shown by experiment.[5] The introduction of plague-infected mice into a cage of healthy mice resulted in the death of everyone of these from plague.

It has also been shown experimentally[6] that rats contract plague by eating the bodies of their fellows dead of plague.

(*C*) *Infection from external objects.*—It is reasonable to suppose that the first rats infected in No. 40 compound contracted plague from some article or food brought to the house by man. There was no other instance in the Ferozepore rat epizootics in which such a method of infection could be shown.

There is every reason to suppose, however, that rats can contract plague in this way from infected houses, &c., just as much as man.

SPREAD OF PLAGUE FROM INFECTED TO NON-INFECTED PLACES.

Supposing with the Indian Plague Commission that the chief source of human infection is contaminated external objects, especially houses, how does this contamination arise, and how does it spread from place to, place and house to house?

There are three possibilities :

(*A*) Spread by human plague cases.
(*B*) Spread by plague-stricken rats and mice.
(*C*) Spread in infected external objects.

EVIDENCE FROM THE ABOVE OUTBREAK AS TO

(*A*) *Spread by human plague cases.*—In Ferozepore human cases did not spread plague from house to house. Among several instances of individuals contracting plague elsewhere and bringing it home to their houses, in no case did the patient infect either his house or his household.

Human cases also appeared to have no infective power towards fomites. The clothes and bedding of patients in the plague hospital were no source of danger to the many attendants who constantly remained in contact with them, and this in spite of the fact that about 30 deaths occurred in this hospital and that moribund cases of plague are supposed to be infective.

(*B*) *Spread by plague-stricken rats and mice.*—Contrast these clothes of the plague patients with those from the rat-infected quarter in the Transport lines which had come in contact with plague-stricken rats and were afterwards the cause of a human case of plague. Rats could evidently infect clothes. They were also most distinctly the means of infecting most of the houses in the Ferozepore outbreak. Dead rats were the first sign of the outbreak in No. 40 compound. Shortly after dead rats were found in the part of the 7th Lancers lines adjacent to this compound, and human cases of plague followed in two days. After the evacuation of these lines, the rats and mice, which inhabited them in swarms due to the presence everywhere of horse's grain deserted, probably from want of food. Numbers were seen going southwards and eastwards. None apparently went towards the bungalows to the north or the open country to the west. Luckily the Native Infantry lines to the immediate south were empty, but plague broke out within a few days in several compounds to the east and south-east, *viz.*, Nos. 36, 35, 33, 41, and 22. In three of these compounds dead rats were found, plague bacilli being demonstrated microscopically in rats from two of them.

(*C*) *Spread in infected external objects.*—The bringing of some infected article was most probably the cause of the outbreak beginning in No. 40 compound.

The outbreak in the Transport lines may have been started in a similar way, or may have been due to the introduction of infection by rats from the adjacent Sadr bazaar.

OTHER EVIDENCE AS TO SPREAD OF INFECTION.

I. From place to place.—The Indian Plague Commission[7] concluded that with the exception of occasional spread by rats from village to one another close by, plague is always carried from town to town and village to village by man either in his own body or in infected articles transported by him. That this is so there can be no doubt. Rats cannot carry plague from one town to another hundreds of miles distant, and it is doubtful whether they migrate to any extent from one village to another only a few hundred yards away.[8]

Of the two methods by which man may spread plague there is much to show that the importation of infected clothes and other articles is a much commoner means of introduction than that of human plague cases. Thus of seven detailed instances of human introduction collected by the Indian Plague Commission in six infection was brought by healthy people who had not developed plague, evidently in infected articles brought by them. In only one instance was the introducer himself suffering from plague, and he died. In the other evidence and medical opinions collected by them in proof that plague is imported by man there is no definite distinction made between introduction by plague cases and that by infected articles. In fact, the evidence given by the Indian Plague Commission forms a very slender basis for their conclusion that plague is often spread by human cases, a conclusion which they rather appear to have taken for granted They give practically only the one instance (among the seven cases just referred to). On the other hand under the heading of importation in clothes, they give a number of specific and definite instances of human introduction in contaminated articles.

Supposing then that infected articles are usually, if not almost always, the means of introduction of plague into a town or village, how have these become infected, by rats or by man? This is a question which the Indian Plague Commission did not go into. We should expect from the greater infectivity of rats as shown above that they can infect articles with which they come in contact much more easily than can man. In the Ferozepore epidemic, we found evidence that clothes from a dwelling where plague-stricken rats had been running about were much more dangerous than those which had come in contact with human plague patients. There is thus some reason to suppose that articles infected by rats are the commonest means of importation of plague, but this needs further elucidation.[9]

II. From house to house.—The Indian Plague Commission[10] concluded that within a village or town plague is spread from house to house both by rats and man. They give a great deal of most conclusive evidence as to the great importance of spread by rats, and a number of opinions of medical men that rats are the most frequent or almost exclusive means of such spread. They acknowledge that only a small minority of witnesses were of opinion that man is of greater importance than rats. The chief argument brought forward as to man's capability of spreading infection from house to house is that in some places human epidemics have occurred with no infection of rats at all. In such cases careful distinction

[5] Manson's Tropical Diseases.
[6] Indian Plague Commission's Report, para. 185.
[7] Indian Plague Commission's Report, paras. 234—238.
[8] Indian Plague Commission's Report, para. 236.
[9] Indian Plague Commission's Report, para. 233.
[10] Indian Plague Commission's Report, paras. 287—293.

must be made between pseudo-epidemics of several human cases who, having all become infected from one source, have then sickened in various parts of a town, giving the appearance of widespread infection, and genuine epidemics in which true house infection has spread throughout the town. Again in these cases the difficulty of proving the absence of rat plague must be very great, seeing how little we know and can observe of the life and diseases of rats about whose ways there is always some mystery; and the difficulties increase when we remember that mice must be included with rats as harbourers of plague.

Without doubt man can and often does spread plague within a town by carrying about infected clothes and other articles, just as he spreads it between towns, but here again the Indian Plague Commission in their evidence on human dissemination make little distinction between spread in infected articles and spread by human patients, a distinction which must be important when prevention is considered. Hence their conclusion that man in his own person is a frequent infector of houses and disseminator of plague appears to be based on the very slenderest of data.

As a result they arrive at two directly contradictory conclusions which they make no attempt to reconcile, *viz.*, that (1) the infectivity of human plague cases towards other men is slight; (2) towards houses, clothes, &c., it is great. It is very much more reasonable to suppose, and there is much evidence in favour of doing so, that man from whose body few bacilli escape has little infective power in all directions, *viz*, towards his fellows, houses, and fomites, while the rat from whose body many bacilli escape has great infective power in all directions. We should then believe, as a large number of observers do believe, that true house infection and house-to-house spread cannot occur to any extent except by the agency of rats, and that before a genuine epidemic of plague can occur in a place rats must first be infected from the nucleus of infection imported by man into that place. This nucleus, we should further believe, is, in the great majority of cases, some article which has previously been infected by contact with plague-stricken rats. Thus, while admitting that human infectivity must not be completely ignored, and is on occasions the direct or indirect source of fresh infections, we should conclude that as a rule man only plays the part of a mechanical carrier in spreading what is essentially an epizootic disease of muridæ (rats and mice), but one which incidentally happens to infect man and other animals. This was Koch's idea of plague[11] and possibly is still.

There is another quite distinct view which has been taken of the spread of plague.[12] This supposes that plague, whether in man or rat, is due to infection by the plague bacillus living saprophytically in soil, and that neither rat nor man are essential to its spread, which takes place by the mechanical carrying of the bacillus by such things as flow of surface washings, air currents, flies, and transportation of contaminated articles. Apart from the fact that there is no evidence that the plague bacillus can live saprophytically in nature (not meaning mere passive retention of vitality), this is an unlikely theory because it supposes that the bacillus can live, multiply and spread in an ectogenous existence. These are the three requisites of survival, and if they are all thus provided for the plague organism outside the body of any host, what possible object can be gained by its endogenous life in mammals. This property of parasitism which has evidently been preserved so carefully for ages by the plague organism, would by the laws of evolution soon become lost if it served no definite use in its life cycle for the purposes of multiplication and spread.

[11] Jenning's Manual of Plague. Koch's Address to German Public Health Society in 1898.

[12] *I. M. Gazette*, July 1904, p. 249, article by Capt. E. F. Gordon Tucker, I.M.S.

THE NATURE OF PLAGUE IN THE LIGHT OF THE ANALOGY OF OTHER DISEASES.

It is probable that in every known infective disease we can fix upon one animal or genus of animals as the definitive host of that disease, that is, a host which would be capable of supporting the existence of the disease in the absence of all other hosts (not including those necessary for a second stage of development such as the mosquito in malaria), and it is probable that no disease has two definitive hosts in different genera of the animal kingdom, either of which would alone suffice for its survival in nature.

Thus of the many diseases which are known to infect more than one genus, it is probable that :—

Anthrax ...	Would die out without	*Bovidae.*—(Oxen, sheep and goats, which are nearly related to one another in the same way as are the rat and the mouse). Anthrax has been largely suppressed by sanitary measures applied to sheep and cattle.
Rabies ...	Would die out without	*Canines.*
Diphtheria ...	Would die out without	*Man.*—(True diphtheria of Lœffler's bacillus.)
Small-pox ...	Would die out without	*Man.*—Cow, sheep, and horse-pox have vanished in England and Germany since vaccination has suppressed small-pox.[8]
Malta fever ...	Would die out without	*Man.*
Tuberculosis ...	Would die out without	*Man.*—Though many animals suffer much from tuberculosis, they only do so when kept in captivity or domesticity by man, never in their natural wild state.
Glanders ..	Would die out without	*Equines* (horses, mules and donkeys).—Glanders is "essentially an equine disease," though transmitted to many other animals, including man.[13]
Rinderpest ...	Would die out without	*Bovines.*—Pigs, camels and deer may be infected.[13]
Foot and Mouth disease ...	Would die out without	*Bovines.*—All even-toed angulates are prone to it. It occasionally attacks man, horses, dogs and cats.[13]
Distemper ...	Would die out without	*Canines.*—Cats, hyenas and monkeys are infected.[13]
Scarlet fever ...	Would die out without	*Man.*—Cows are infected (Klein).

Numerous other diseases obviously depend entirely on one host for their survival.

Tetanus and malignant œdema seem to be exceptions to this apparent rule so that an infective disease has two definitive hosts. They attack man and all domestic mammals (probably wild ones too), and no particular genus can be singled out as host.

The bacilli of these diseases are ubiquitous in soil and are saprophytic. They can live, multiply and spread ectogenously. Hence, as pointed out above, no apparent object can be gained by their parasitic growth in animals, and on consideration it will be seen that this growth is not a true parasitism, and that these two diseases must be placed in quite a separate category from those mentioned above. Firstly, both bacilli are obligatory anærobes which prevent them from growing in the living blood. Secondly, they both appear to require in the body saprophytic conditions, reproducing those in which they grow ectogenously. Thus the tetanus bacillus requires suppurating or contused wounds in which to flourish, and that of malignant œdema only grows in subcutaneous connective tissue containing effused blood or lymph as the result of injury and from which fresh arterial blood is shut off by pressure.[13] It rapidly grows in the

[13] Friedberger & Fröhuer's Veterinary Pathology translated by Hayes.

blood of the cadaver, and is found in many corpses quite apart from infection during life. In spite of the ubiquity of these bacilli, both diseases are rare, showing that these conditions for infection rarely arive. No particular object in their life cycles can be gained by these bacilli in their occasional invasions of animals. These would appear to be due to the chances production in the living body of condition similar to those in which the bacilli flourish ectogenously and not to be of a parasitic nature at all. The chemical products of the bacilli are toxic, and hence produce illness as do ptomaines of other bacteria when absorbed from the alimentary canal.

Thus it is probable that every infection should be studied as a biological problem from the point of view of the infector, and not solely as a pathological one from that of the infectee, and that an account of any infective disease in order to be complete should state whether the infector gains any particular objects in its life cycle as a parasite, and what these objects are, and what genera of animals are capable of supplying them and of supporting the existence of a parasitic infector in nature.

Returning to plague, it is evident that the plague organism is a true parasite depending on parasitism for its multiplication and spread. It is capable of invading many different animals, but by the analogy of other parasitic diseases and our general knowledge of parasitism in nature, it would seem highly improbable that it has more than one host which would alone suffice for its survival. This host must be either man or the muridæ, and everything goes to show that it is the muridæ. Thus: –

(1) Besides the causes of infection of man there is added in the case of rats and mice that by direct infectivity from individual to individual.

(2) The bacillus much more easily overcomes the resistance of the blood in muridæ than in man, producing in the former almost always rapid septicæmia

(3) The case mortality is much greater among muridæ than man.

(4) Suppose a ratless and mouseless community of men. Could plague occur in epidemic form among their towns and villages? The answer is at least doubtful

(5) Suppose, on the other hand, that the whole of mankind could become suddenly and completely immunised to plague. Could plague continue to flourish among their rats and mice? There is no reason whatever to suppose that it could not.

The conclusion therefore is unavoidable that the muridæ are the sole definitive hosts of plague, and that their offices as hosts, but those of no other animal are essential to the survival of plague in nature, its ability to infect the bodies of man and other animals being due to an accidental resemblance of their bloods to that of the muridæ in the absence of some plague-resisting element.

Furthermore, plague is probably dependent almost entirely upon the *domestic* muridæ, in whose conditions of life dirt and darkness favour the survival of infection for long periods in their homes outside the animal body, and crowding, permit of rapid spread of infection from individual to individual.

Hence, apart from the offices of host, man is manifestly of much importance in the existence of plague, in that the domestic rat and mouse depend on him for their existence, and in that he acts as the chief transporter of infection to fresh communities of muridæ along lines of human travel in contaminated articles and otherwise.

If we take this view of plague, it bears a most singular resemblance to anthrax. Thus **plague / anthrax** is essentially a disease of domestic **muridæ / bovidæ** frequently communicated to man and many other animals. In that these domestic **muridæ / bovidæ** are dependent on man **plague / anthrax** also depends on man, but not on his offices as host. The spread of **plague / anthrax** depends much on man's movements and his transportation of infected **fomites, food, &c. / animals, meat, skins &c.** from place to place. The history of anthrax shows that it is a very old disease and has occurred in most terrific outbreaks among animals and men comparable only to outbreaks of plague. To quote one instance[1], in 1617. 60,000 people died of an outbreak supposed to be anthrax; many similar outbreaks are related. In modern times such occurrences are unknown, and human anthrax is rare. The disease has been controlled by careful sanitary and preventive measures applied to sheep and cattle, the fact of their control demonstrating what before was not obvious, that anthrax is essentially a disease of sheep and cattle. When plague has been similarly controlled by measures applied to rats and mice, we shall perhaps realise that it is a disease of muridæ.

Anthrax in these historic outbreaks appears to have possessed a virulence towards man which nowadays is not seen. This may be explained by supposing that when the disease was so widespread, many opportunities occurred for the bacillus to undergo successive passages through the human body and thereby acquire an adventitious virulence towards and power of infecting man. This probably happens also in plague and accounts for the virulent form of pneumonic plague rarely seen nowadays and of pneumonic and hæmorrhagic plague described in history and apparently common in the past. Our modern preventive measures applied to man have probably been so far successful that they have precluded the possibility of such successive passages of plague through man frequently occurring, with the consequent increase of virulence and occurrence of abnormally infective human outbreaks.

PREVENTION OF PLAGUE.

If this view of plague be correct, the following corollaries as to prevention need no proof :—

I. Precautions against human infection.—Live in a house free of rats and mice and one which will not preserve infection in floors, &c., should it gain admission. When plague has entered a house or village flee from infected houses and diseased rats and mice, and shun all objects which may have come in contact with them.

Before reoccupation be sure that there are no more diseased rats and mice, and that houses, etc., are disinfected by unroofing or otherwise.

II. Suppression of the disease.—This resolves itself into prevention of spread, since, if confined to small localities, plague must die out from want of fresh hosts. Segregation of human contacts and isolation of human patients can be of no more use towards checking plague than they would be towards checking anthrax. As just explained, they may prevent the occasional production of adventitious virulence of plague towards man.

Inoculation, too, can (in my opinion) be of no use as a suppressive measure when applied to man Anthrax inoculation, though very successful in producing immunity, is not applied to man, but to cattle For this purpose plague inoculation should be similarly applied to rats and mice. We might as well hope to suppress small-pox by vaccinating cows as to suppress plague by inoculating man.

Disinfection or absolute exclusion of articles coming from rat-infected places is of the greatest importance. Seeing that a human case may start rat plague in a fresh locality, quarantine of man and detention of plague-stricken travellers have some importance.

The essential measures are those applied to rats and mice. The chief must be wholesale destruction, since it is difficult to see how sanitation can be applied to these animals beyond so far as possible preventing the access

[1] Friedberger and Fröhner's Veterinary Pathology (translated by Hayes).

to them of imported infection. Something might be done towards segregating an infected colony by establishing a rat-free zone around it either by destroying all rats and mice in the adjacent houses or by causing them to desert. Such methods as releasing tarred or half-skinned rats into their holes are known to cause all the inhabitants of these holes to desert. Reliance must, however, be placed chiefly on destruction. This must be undertaken in an organised and systematic way by the corporate authority and not left to individual householders. The experience of the Japanese shows that there is much hope of the success of such measures. In four Japanese cities in which plague had prevailed for years a short application of a general destruction of rats arrested the disease."[14]

GUAIAQUIN: A REMEDY SUGGESTED FOR PIROPLASMOSIS, *KALA AZAR* AND OTHER ALLIED FEVERS.

BY M. C. NANJUNDA ROW, M.B. & C.M., F.C.S.,

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THE cause of the various chronic irregular fevers, which have for long defied medical treatment in a majority of instances, has for some time been exercising the mind of the medical profession. The recent discovery by Major C. Donovan, I.M.S., of the invariable existence in the spleen of a certain peculiar parasite which he has called piroplasma, in many of the fatal varieties of what is locally known as "Black Town Fevers," and by Drs. C. A. Bentley and L. Rogers of similar bodies in *kala azar* patients, leads to the conclusion that the maladies are traceable to them. The importance and value of the discovery can never be overrated, and great credit is certainly due to the discoverers for their pains. From the standpoint of the patient the discovery is of little avail, for it matters little to him whether the fever is caused by piroplasma, trypanosoma or ankylostoma, so long as you have no means of curing him. For instance, a patient is said to have lately refused to get his spleen punctured, which an eminent physician of this place proposed to do for the purpose of diagnosis, and bluntly asked him, "Supposing you find the parasites you seek for, in the blood of the spleen, can you cure me?" In reply the doctor had to confess that he had no cure for it, to which the patient remarked that it was as well to treat him on some other hypothesis.

In much the same strain does Major Donovan write in his Annual Report of the Government General Hospital, Madras: "The treatment was most unsatisfactory, no drug having the least beneficial effect." And again, after referring to his discovery of the cause of such fevers, he continues, "quinine has been given by mouth, hypodermically and intramuscularly *ad nauseum*, with no appreciable results. The same may be said of other less suitable drugs, *i.e.*, arsenic, salicylate of sodium, carbolic acid, etc." "Of the 31 cases of natives admitted into the General Hospital during the year under review, into Major Donovan's wards," he says, "13 died, 4 were removed moribund, and 13 were discharged at their own request always in a worse condition than on admission, and one still remains in hospital. ...The disease is very common in Madras, especially in Black Town, and, generally speaking, all cases of that convenient disease 'chronic malaria' or 'malarial cachexia' are nothing but piroplasmosis."*

In the course of my limited practice, I have come across various cases of fevers of the kind indicated above yielding to none of the recognised and known remedies for fevers, even though they were one after another very persistently pushed. In a few recent cases of the kind I have been trying an American preparation with such encouraging results as to afford the doctor some means of at least mitigating the severity of the disease in the more advanced stages, and of curing the same in the earlier stages. I record those results in this paper, in the belief that it will lead to and stimulate a more extended trial of the drug by the medical profession both in its own interest as well as for the benefit of the suffering humanity.

Having read about two years ago of the use of the preparation called guaiaquin, a compound of guaiacol and quinine, which was said to have been found very efficacious in some of the so-called æstivo-autumnal fevers of America, which were reported to have resisted large doses of quinine and arsenic, and having known how some of the "Black Town Fevers" defied all medical treatment, I sent for a supply of the drug and tried it on a case of such fever, and to my surprise the result was very encouraging (*vide* Case No. I). The case was diagnosed as one of malarial cachexia—a stage of the malarial disease where no longer quinine and arsenic had any influence. Since then I have tried the drug in some more cases, and I give hereunder brief notes of a few of them.

Case I.—*Thayammal*, a young woman, about 17 years of age, a resident of Black Town, part of Madras, was brought in May 1903, with a history of having had intermittent fever for three months previously, and been drugged with quinine and arsenic by several practitioners. Latterly it was said that the fever assumed a low type, and there was no intermission whatever. On examination, she was much emaciated, skin harsh and dry, abdomen bloated, spleen an inch below the umbilical line; slight enlargement of liver, the lower edge being about one inch below the costal arch; urine scanty and high coloured, but no albumen or bile pigments, and temperature 100° F.; there were some black or brown patches of pigmentation on the face about the molar prominences. Heart and lungs normal. She was

[14] Jenning's Plague Manual.

*[We understand that these cases are now being successfully treated in the Medical College Hospital, Calcutta. The main object of treatment is to establish a leucocytosis; if this is done, all can go well.—ED., *I. M. G.*]

placed on 4 grains of guaiaquin in pills four times a day. This was increased after six days to 6 grains four times a day. The fever reached the normal about three weeks after. The pills were then continued along with ½-grain doses of arrhenal (disodic-methyl-arsenate), and the patient made a good recovery after three months' continuous use of the pills. Her periods, which had stopped after the attack of fever, came on regularly, and she is now in best of her health, having had no recurrence of fever after that.

Case II.—*Ethiragammal*, another young woman of about 16 years of age, resident of Black Town, came under treatment on 13th of August 1903. She gave a similar history of having had fever over a year previously off and on. The fever at first used to leave her for a month or so and recur, but for the last two months nearly it had been of a low type; and the body had always been warm to the touch. On examination temperature was found to be 99·8°F. Face ashy pale and bloated; skin harsh and dry, and covered with itch, abdomen bloated, spleen much larger, reaching about an inch-and-a-half below the umbilicus, pulse weak, and 120 per minute, black pigmentary patches all over the body, and slight œdema of both feet. Liver normal, urine scanty, high coloured and contained a trace of albumen, tongue and mouth very sore and red.

She was placed on 3 grains of guaiaquin pills with liq. bismuthi-sedativa, three times a day, but no improvement was observed after a fortnight's use of the pills, and so the pills were doubled for each dose. This the stomach resented, and she began to vomit; the pills had to be stopped. The stomach was treated to get its irritability allayed, but the low fever continued as usual. About twenty days after, another attempt was made to give the pills, but again with the same gastric troubles, and so the case left me and sought some native treatment with what result not known. It must have ended fatally.

Case III.—*Balambal*, a Brahmin girl aged about 12 years, a resident of Tanjore, was brought to me on the 17th of October 1903, with a history of having had fever off and on for nearly a year previously and of sometimes being free from fever for a month or two, but for nearly a month previous to her coming to me, the fever was said to be of a low type and to have been on constantly. Besides, there were large pustules all over her legs and thigh, and small itch like *eruptions* as well.

On examination the patient was very anæmic, abdomen slightly enlarged and spleen also slightly enlarged, reaching about half an inch above the line of the umbilicus; temperature 100°F. Skin was dry, but soft. Urine slightly high coloured, but otherwise normal, liver and other organs normal. Her father who knows the use of quinine is said to have given her large doses of the same without any effect.

She was placed on 4 grains of guaiaquin four times a day, the fever came down to normal about a fortnight after, and she made an uninterrupted recovery. She is now enjoying normal health.

Case IV.—*Miss M.*, a Eurasian woman aged about 25 years, residing at Vepery, Madras, was brought to me on the 17th May 1904 with the following history and progress under guaiaquin treatment in her own words as follows:—"Felt a severe attack of headache and feeling sick of stomach about a month before the fever started. On the 19th July 1903 I had slight fever with constant vomiting. On the fourth day fever rose to 103 or 104°, and it continued for three months in spite of treatment. I was advised to take a change, and I went to Saidapet. My bowels, which had not moved naturally all the time, have been natural since, but still my fever continued. I went from there to Pallavaram for 17 days, but seeing the place doing me no good returned to Madras. My spleen began to increase. My fever would rise to 100 to 102° for a few hours and would fall to normal. I was advised to shift to San Thome, which I did on the 1st May 1904, and I came to you on the 17th May. The fever by the end of May was never more than 100°, and by the end of June, I was normal and is still continuing. My present feeling at times is a sort of drawing pain and sick on stomach, and after either I retch up or have a good motion, I feel quite myself. This feeling only lasts for an hour the most."

When the patient came under treatment she was very emaciated, being only skin and bones. Skin very pale and sallow, spleen enormously enlarged, reaching nearly two inches below the umbilicus and an inch to the right of the median line of the abdomen, hard and tense to the touch. Liver slightly enlarged; urine scanty and high coloured, but otherwise normal.

She was given 4 grains of guaiaquin four times a day for a week with no appreciable improvement. The dose was increased to 6 grains four times a day, when about the end of the second week, it began to go down. She was given 9 grains four times a day during the third week, when the fever gradually went down, and about the end of June about six weeks after commencement of treatment, the fever came to normal, and has remained normal ever since. After the fever came down to normal, she was given along with the pills one tabloid of suprarenal glands 5 grains, and one-grain dose of *arrhenal* in solution after meals. The spleen has gone down.

Case V.—*Varadarajalu*, a young Hindu, aged about 22 years, came to me in March 1904 for a low fever and troublesome cough, with a history of having had fever off and on for three months previously, and cough for a fortnight only. On examination, I found fine mucous râles all over the lungs posteriorly, but no consolidation anywhere. He was much emaciated, and the skin was dry, harsh, and covered with scabies like eruptions. Spleen not being enlarged, I thought it to be some tubercular affection of the lungs, and I placed him on twenty-drop doses of creasotal with a stimulant cough mixture. When I saw him again after a fortnight's treatment, I found his lungs completely free from râles and his cough practically cured, but the low fever continued as before. On a more careful examination of the abdomen, I found the spleen slightly enlarged and was about the size of a cricket ball. Then, suspecting it to be a case of Black Town fever, I placed him on 6 grains of guaiaquin four times a day. He began to improve, and about the end of three weeks after commencement of the guaiaquin treatment his temperature became normal, and he continued to be free from fever for a week after that, and was taking the pills regularly. But at the end of that week he returned to me with the mouth, lips and gums very sore and with inability to open his mouth. The pills had to be stopped and some paliatives prescribed, and it took nearly a fortnight before the inflammation subsided. About that time the low fever relapsed when the pills were again prescribed, but the stomach could not bear them. Pain in the abdomen and diarrhœa set in, and the pills were stopped, and the patient left Madras for a change to his village. Three weeks after he returned with an ischio-rectal abscess, which took nearly a month to be healed. Still the low fever and enlargement of the spleen continued, and another attempt was made to give the guaiaquin pills, but two days after taking them, pain in the abdomen and mucous diarrhœa recurred, and the pills had to be stopped. As the pure drug itself was not available anywhere in India, I could not try the drug hypodermically, and so he left for his village, where I learnt subsequently he died from the effects of diarrhœa.*

* Dr. Row sent a lot more similar cases, which we are unable to publish for want of space. Sufficient has been said to encourage others to try the remedy guaiaquin. L. Rogers and others have suggested the use of bone marrow in these chronic infections.—ED., *I. M. G.*

A Mirror of Hospital Practice.

A CASE OF OVARIOTOMY IN A WOMAN AGED 70—RECOVERY.

BY R. J. MARKS,
MAJOR, I.M.S.,
Civil Surgeon, Bijnor.

ON the 30th June, 1904, a woman named Perano, aged 70, caste Chamar, was admitted into the Dufferin Hospital, Bijnor, suffering from a large tumour of the abdomen.

Patient stated that she had been a married woman and was now a widow, had had ten children, of which two were now alive, the others had died at various ages. Menstruation had ceased twenty odd years ago.

She stated that she had first suffered much pain in the right groin for about a year, and after this a tumour began to form which rapidly grew and extended over the whole abdomen. During the last six months she had suffered from a bloody discharge from the vagina.

On examination of the abdomen, a large tense tumour was found occupying the upper $\frac{5}{6}$ ths. of the abdomen extending up to the liver and spleen, and downwards to within 2 inches of the pubis. The uterus was found to be quite free.

Operation.—On the 2nd July, the patient having been prepared with the usual antiseptic precautions, and the bowels having been cleared with a dose of castor-oil the night before and an enema on the morning, was placed on the operation table and an incision 3 inches long made in the median line, immediately below the umbilicus. Any bleeding was controlled by Spencer Wells' artery forceps.

The tumour which was pearly and glistening was tapped with a large Spencer Wells' Trocar and cannula, but the contents of the tumour was so viscid and thick that it would not flow through the cannula, and began to ooze out around the sides.

Fearing that the contents might flow into the abdominal cavity, and as the tumour was very slippery and hard to manipulate, the abdominal incision was enlarged upwards another inch.

The tumour was then firmly grasped and pulled forward, so that the sides of the tumour should press against the sides of the incision, and prevent any of the contents of the tumour getting into the abdominal cavity. When the tumour had been largely emptied of its contents, it was pulled out of the abdominal cavity, the pedicle ligatured with thick silk, and separated.

The stump was then carefully examined and returned into the abdominal cavity. The abdominal cavity was then thoroughly washed out with warm sterilized water, and no swabbing of the peritoneal cavity or toilet performed. The warm sterilized water was allowed to remain in the cavity.

The peritoneum was sutured with thin silk, and the abdominal walls closed with thicker silk sutures. Antiseptic dressing applied, and a body roller for support to the abdomen.

The patient made an uneventful recovery, was not sick after the operation, and never had an untoward symptom.

The dressings were removed for the first time on the 11th day, when the sutures were removed.

She has left the hospital, and is in good health.

REMARKS.

This was a very straightforward case, as the tumour was a large unilocular cyst, and there were no adhesions.

But the case is interesting on account of the perfect recovery, after a severe operation, in a woman of 70 years of age.

After thoroughly irrigating the peritoneal cavity with warm sterilized water, the cavity was not swabbed out, nor the water removed.

The peritoneum is capable of great absorption, and water being a natural constituent of the blood, it was thought beneficial for the patient for it to remain. It would increase the blood pressure and act rather as a stimulant. The peritoneum moreover is a very tender membrane, and does not care for much interference.

The patient certainly never suffered from sickness or that severe thirst which is very often present in these cases.

My thanks are due to Assistant-Surgeon Sri Ram who helped me in the operation, and Female Hospital Assistant Miss Nathaniel, of the Dufferin Hospital, who looked after the case in its convalescence.

A CASE OF ELEPHANTIASIS OF THE PENIS.

BY H. INNES, M.B. (LOND.),
CAPTAIN, I.M.S.,
Barisal.

FROM the descriptions in the books it would appear that the penis is but seldom affected with elephantoid disease, and therefore it may be of interest to record the following case:—

B. L., a well built Hindu male of 26 years of age, was admitted to the Bhagalpur Hospital, on the 3rd September 1903, suffering from an enlargement of the penis. He was very hazy about the duration of the disease, but put it at a year or 18 months; two years ago he had syphilis and a sore on the penis, from which it follows that it was then of normal size. Some time after he had noticed the gradual increase in size, he sought the advice of a native physician, and the numerous scars on the lower abdomen and the deep scars on the penis testified to the heroic nature of the measures adopted. The photograph shows the condition on admission and renders any detailed description unnecessary.

The details of the operation, which was performed on September 8th, are shortly as follows:—

The line of demarcation between healthy and diseased skin was first marked out by superficial incisions, an elastic tourniquet was applied and the separation of the affected structures proceeded with, the enormously hypertrophied prepuce was slit up on a director and the glans penis exposed; with this as a landmark the body of the organ was dissected out without much difficulty except for the dense adhesions formed by the scarring that had taken place, the dorsal vein was found to be a useful guide to the depth of the dorsal incision.

The left testicle and cord were not involved, but the right cord had to be cleared almost up to the external ring; there was a small hydrocele of the right tunica. The diseased portion of the scrotum was then cut away, and room for the testicles having been found, the edges of the skin were brought together and a drain inserted at the lower angle of the wound. The mass removed weighed 2lbs. 11oz., of which 2lbs. 8oz. were penile and 3oz. scrotal tissue.

Hæmorrhage was conspicuous by its absence, but there was some troublesome oozing from the right corpus cavernosum which had been dissected rather too cleanly; for this reason a dry dressing was applied, and consequently its subsequent removal was rather a tedious and painful process. The patient was kept under bromide for obvious reasons and dressed daily with cyanide gauze for the scrotal wound and boracic ointment for the body of the penis. His progress was uneventful except for a small abscess which developed round the stitch, securing the right gubernaculum testis to the tissue on the inner side of the thigh. On the 23rd September, the scrotal wound being soundly healed, and the body of the penis covered evenly with granulations, he was skin-grafted by Tiersch's method; it was surprising what a lot of skin was necessary, the grafts took exceedingly well, and the patient left the hospital of his own accord, secretly and by night, with some of the hospital property, on the 8th October, with a very

presentable penis. I regret that, on account of his sudden departure, a second photograph was not obtained.

It will be noticed that the grafts were applied direct to the granulations, which were not scraped away as usually recommended; this was done to avoid the copious oozing that must have taken place, and for the same reason the grafting was not undertaken at the first operation.

The blood was not examined. The condition of the scrotum was that usually termed lymph scrotum; there was no enlargement of the groin glands.

His left long saphenous vein was varicose, and his father also suffered markedly in the same way.

CASE OF HYSTERICAL CATALEPSY.

BY E. F. GORDON TUCKER,

CAPT., I.M.S.

K. K., aged 30, a male Hindoo, resident of Kathiawar, was brought to my out-patient room at the J. J. Hospital early last year, by his brother, on account of the patient's peculiar mental state, refusal to take food, and complete constipation as he stated, for seven days, with retention of urine for a day and-a-half. The patient was a fairly well nourished man, hair on the temporal region greyish, a little under the middle height. In the out-patient room he stood passively for examination with the eyes kept half closed, and with the look directed towards the ground. He walked in any direction in which he was led. He did not appear to notice any impediments in his path, but required assistance in descending some steps. He appeared incapable of initiating any voluntary movement.

There was no response to any order or question. He closed the eyes spasmodically when an object was brought rapidly near to them. He evinced no signs of pain when the examiner's thumb-nail was forcibly pressed under his thumb-nail, nor when sensation was examined for by means of a pin. The face was expressionless.

There was not the slightest resistance to passive movements of his limbs or body; but he stood as he was placed. In however awk ward a position a limb was placed, it was retained there apparently without fatigue, for an indefinite time and without conscious effort. He was therefore placed with his face towards a wall, and with his right arm extended above the head, and slightly flexed at the elbow. The left arm was abducted, the elbow semi-flexed, and the hand supinated. A pencil mark was drawn round the right hand on the wall, and he was left undisturbed for three-quarters of an hour At the end of this time it was found that he had scarcely moved, the right hand having been lowered about two inches.

The patient had been brought up by his brother who was the elder by about two years. The two brothers were very much alike in

appearance and facial expression. The history given by the elder brother was that the patient had been similarly affected about two years before, though in a milder degree, and this condition had lasted for two months. He had been in some up-country hospital and had been discharged cured.

Two months after this man's discharge the elder brother himself developed the same symptoms, and was affected for about two months, during which period he was attended by the patient. The patient's present illness was of six months' duration. He relapsed after having been terrified by the threat of assassination by some enemy. The fear of this undoubtedly preyed upon his naturally weak intellect. He lost his appetite, memory became impaired, and he gradually drifted into his present apathetic condition.

On examination after admission, he lay in bed with the eyes closed and oblivious to all external objects and movements. The expression was vacant. The mouth was kept shut, and it required the use of a screw gag to open it. When raised from the recumbent position he remained in any position however awkward it might be. When pushed or pulled back into a more easy position, there was at first slight muscular resistance, but he dropped into the position of rest a little later. When the lids were forcibly closed he appeared to doze off at once. When he was roused in the early morning, the eyes were not opened spontaneously, but had to be forcibly opened, and he made no attempt to shut them again. There was some tremor of the lids during sleep. No notice was taken when the skin was pinched or pricked. But when a hot object was applied to the skin the part touched was immediately removed.

The knee-jerk was exaggerated, ankle clonus present, cremasteric reflex easily obtained. Food had to be given by means of an œsophageal tube. He struggled somewhat when this method of feeding was begun, but speedily became used to the process. Urine and fæces were passed unconsciously. The thoracic and abdominal organs were healthy; pulse 72; respirations 19. He was fed at regular and frequent intervals with the œsophageal tube for five days, during which there was no change in his mental condition. On the fifth day a strong continuous current was applied, and on the strength being increased he called out to stop. The poles had to be forced into the clenched and flexed fingers, but when once they were applied he made no effort to throw them from him. On the seventh day the current was applied until he put out his tongue and spoke his name as he had been directed. When the current was discontinued he immediately relapsed into his former cataleptic condition. On the eighth day he opened his eyes, answered questions, rose and walked about the ward according to orders, under the influence of battery shocks, when he showed signs of relapsing into his apathetic condition.

On the following day he appeared to be getting tired of forced feeding and electricity, and got up from his bed and came across the ward to me and asked to be sent home.

Improvement continued, and on the twelfth day he was taking his food naturally, sometimes hesitating to take it, but at once obeying when the battery-box was shown him.

His brother, who was a hysterical, feeble-minded person, and had attempted to obstruct treatment, insisted at this point on taking him back to his country.

I append a photograph of the case, which shows this interesting condition well.

A CASE OF CRYPTOPTHALMUS AND PARTIAL ABLEPHARIA.

BY R. H. ELLIOT, M.B., B.S., F.R.C.S.,
MAJOR, I.M.S.
Superintendent of the Government Ophthalmic Hospital, Madras.

THE child shown in the photograph was brought me in consultation by Dr. C. V. Kirshnasawmy, to whom I am indebted for the notes of the case.

A male Hindu child, *aet.* 5/12 year, weighing 12½ lbs., height 24½ ins., born in the Godavary District. Body well developed; temperament cheerful; appears normal in all respects save the condition of the eyes and their appendages.

No congenital defect can be traced in the family; the mother and father are well developed, strong, healthy and above the average native in size. A brother and sister are both strong and healthy.

Right side.—An eyeball is present covered with smooth skin under which the globe moves freely. A faintly pigmented horizontal line indicates the line of division of the upper and lower lids, but there is no farther demarcation, and no lashes are present. The ball moves in all directions beneath the skin; but it is not smooth, and one is given the impression of a small, irregular and staphylomatous cornea.

Left side.—There is a palpebral fissure ½ inch long, and corresponding to the temporal portion of the normal fissure; the distance between the bridge of the nose in the midline and the inner canthus being one inch. Under the smooth skin of this area is felt a small, and not freely moveable lump, which is probably the remains of the left eyeball. The lower lid is well formed, and of normal thickness; it possesses eye-lashes and a punctum lachrymale; the upper lid is not distinctly demarcated, but it is continued almost uninterruptedly on to the conjunctiva lining the small socket. The appearance of this side suggests to one the wasted socket of an enucleated eye. The whole space covered by the lids is only ½ inches long, ½ in. broad, and ¼ in. deep. Tears flow into it, when the child cries.

The mother was very anxious that something should be done for the right eye. My own opinion was that no real conjunctival sac would be found; however, to comply with her wishes, I cut down, and found that there was an abortive globe separated from the skin by a quantity of loose areolar tissue. It was obviously useless to do anything but close the wound.

Remarks.—Cases of this kind are sufficiently common to hold a recognised position in text-books, but are still of considerable interest. The condition of the left side closely imitates "the entire absence of lids" which Fuchs calls "ablepharia," whilst that of the right side has been called by Zehender "cryptopthalmus." The interesting double case published by Captain Newman in the March No. of this Journal, would appear to also come under the latter designation rather than under the former.

IMPACTED STONE IN URETHRA.

BY BASHARAT HOSSAIN,

C.H.A.,

Dispensary, Jagarnathpore, Singkbhum.

PITHU, a Hindu male, aged 55, inhabitant of Gobargoan, 10 miles south from the Charitable Hospital, Jagarnathpur, attended as an outdoor patient on the 30th July 1904, complaining of a sensation and bearing-down pain in the urethra. The patient also stated that he had a constant desire to make water; the urine dribbled. The act of urinating was accompanied with severe pain.

Previous History.—About a year ago the patient began to feel pain and uneasiness in the urethra; later on this was accompanied with symptoms of retention of urine.

Diagnosis.—Externally the part was swollen and hard. Internally on introducing a catheter into the urethra a hard substance was found adherent to the mucous membrane just below the symphysis pubis. A sound of stone was heard when tip of the catheter touched the calculus. Catheter could not pass down to the bladder.

Treatment.—Failing to push the stone forward or backward, steps were at once taken to perform an operation. He was placed under chloroform, and a free incision about 1½ inches made in the spongy portion just above the antiscrotal part of the canal. The stone was facetted on one side, catheter introduced into the bladder, and another stone detected. The wound was dressed and bandaged. Three hours after the operation a stone appeared in the meatus, and it was removed by forceps. The weights of calculi after being dried in the sun were grains 20 and 4½ respectively.

31*st July* 1904.—Stitched the wound with silk ligature and a soft Indian rubber catheter tied in.

3*rd August.*—The stitches were found to have given way, and the portion of the wound was found to be sloughy looking, caused by the negligence of the patient in that he walked more than 500 yards and went downstairs in the evening.

11*th August.*—Urine passed through the meatus, wound heated, no urine passed through the wound.

14*th August.*—Patient left the hospital without permission.

Remarks.—On the 5th August 1904, after applying the pad, urine began to pass in a very little quantity through the wound and in a good stream from the meatus. It is important to mention here that pressure is necessary on the wound of urethra to cause union of the flaps together and help the urine to pass straight towards the meatus.

THE

Indian Medical Gazette.

DECEMBER, 1904.

THE LATHYRISM INQUIRY.

IT may be remembered that in February 1903 we announced that the Government of India had determined to hold an inquiry into the prevalence of lathyrism in the Central Provinces, and that Major Andrew Buchanan, I.M.S., M.D., had been appointed to conduct the inquiry.

The Report is now before us and we may at once say that it forms a complete and valuable monograph on this disease.

The Report announces no new discovery in the causation of this disease, but proves, to our minds, conclusively that the common belief which connects the prevalence of lathyrism known with the long and excessive use of the vetch botanically as Lathyrus sativus (vernacular *teora* C. P., *Kesari*, Northern India) is correct.

The Report gives an interesting sketch of the history of the disease in India and in other countries. The best known accounts of the disease in India is that in Sleeman's *Rambles and Recollections*, where he describes whole villages of paralytics in the Saugor District and in the neighbouring districts of what are now the United Provinces. Sleeman wrote in 1833. The next important account is by Dr. Kinlock Kirke in 1845, who described a serious outbreak in Sinde in that year. Next comes the very full and valuable report by Dr. Irving, then a Civil Surgeon of Allahabad, in 1857 and following years. Dr. Irving's account is of great interest, and his descriptions are so accurate that they cannot be surpassed. They will be found in volumes 6, 7, 12, and 23 of the long extinct *Annals of Indian Medical Science*, and some interesting extracts are printed from them by Major A. Buchanan in an appendix to his report.

There is a strong popular opinion in favour of the connection between the consumption of *kesari* and the spastic paraplegia symptoms of lathyrism. Of course persons are found to tell one that they know of cases where the patients hardly ever or never ate *kesari*, but on investigation it is found, if the case is one of lathyrism at all, that the patient ate some inferior mixed grains, which on examination prove to be lathyrus. The essential conditions are as follows: (1) a large quantity, *i.e.*, a large proportion, of the daily food must have consisted of this grain, (2) this use of it must have continued for at least two or three months. It is probable that when *kesari* is eaten as bread with the husk, it is more deleterious. We have been told by men in Bengal that they could see no reason for the prohibition of the use of *kesari* in Bengal jails, they usually stated that they had seen it used and without harm. Quite true, but in Bengal it is rarely used, and it is used in small quantity and as a *dal;* hence the two essential conditions are not fulfilled, and the argument falls to the ground.

These two conditions, *viz.*, large quantity and long time must always be borne in mind when one is investigating any cases of this unfortunate complaint. Cases of lathyrism are always connected with times of scarcity or famine, because this grain often survives, when wheat and other food crops fail and because it is cheap. The people well know that its continued use will produce paralysis, but they always hope to be able to leave off before serious symptoms have supervened.

The Report deals fully with the symptoms of this paraplegia. Women are much less affected than men, a fact of which no wholly satisfactory explanation is forthcoming. Children often suffer. The severity varies according to the length of time and the quantity of the grain consumed. If a man eats pure *teora* (*kesari*) for about two months he gets cramps in his legs; if he then stops he may recover entirely; but even then will be noticed "an up and down movement of the shoulders," the patient's toes may drag slightly on the ground, and if he attempts to run he will very likely fall. If the patient continues to eat *teora*, he may experience a sudden attack of paralysis, but if at last warned, he gives up the use of the grain, he will slowly recover, and soon be able to walk about with the aid of a stick, his toes will scrape the ground, and the muscles of the back of his leg will be rigid.* If in spite of warnings or from dire necessity the patient continues the use of the grain he will loose control over his bladder and rectum sphincters. Even at this stage the disease is capable of arrest and improvement if the supply of *teora* is stopped; but the utmost that can be expected is an ability to hobble along with the aid of two sticks. A further

* We saw dozens of men in this stage in Shahabad District in 1897-8 after the scarcity.—ED., *I. M. G.*

stage is described in the Report as that of the "crawlers." These unfortunates have eaten *kesari* for a long time, and have become unable to do more than crawl. It will thus be seen that if only the patient will remove the cause, *i.e.*, stop eating lathyrus, he can to a considerable extent, recover the partial use of his limbs.*

The characteristic gait and "stance" of a lathyrus patient is well known, the dragging of the toes is a marked symptom, there is usually a tendency to crossed-legged progression.

Major Andrew Buchanan's Report deals with the geographical, agricultural and famine influences which affect the prevalence of this serious complaint. As regards the degree of prevalence, the Chief Commissioner ordered a Census of the cases of lathyrism in the five districts, Hoshangabad, Narsingpur, Jubbulpore, Damoh, and Saugor, and there was found a total of 7,786, consisting of 5,775 males, 759 females and 958 children. This shows the very marked difference in the number of females affected. The epidemic, as it may be called, lasted in the Central Provinces from 1896 till 1902.

The evidence in favour of regarding lathyrus as the cause is considered under three heads—(1) the evidence of those who ate the grain, and all who were paralysed admitted that they had eaten lathyrus in large quantity and for a long time; (2) the fact that none were paralysed who had not eaten lathyrus, and (3) that others who on finding they had some unusual sensations, had ceased to eat lathyrus, and had escaped from the disease.

It is not possible to say much that is of value as regards the therapeutics of this form of paraplegia. Dr. Quinn treated some 400 cases with strychnine and considered it of no value, on the other hand Major W. D. Sutherland, I.M.S., thought strychnine beneficial. There remains the important question—Can the disease be prevented?

The cultivation of lathyrus has been prohibited in Europe in 1671, and in 1829, in Algeria in 1881 and at Allahabad in 1870, but at present in the Central Provinces this is not a practical policy, though, where the grain is not grown for feeding cattle, but only for issue to farm servants, some sort of restriction is probably advisable. Major A. Buchanan, however, is inclined to educate the people to the danger of continuing to eat this grain. This admirable report is concluded as follows:—

"It has been shown that lathyrism is due to the consumption of lathyrus, that the disease, when it occurs in big epidemics, follows famine or scarcity; that it is chiefly confined to wheat-growing areas; that failure of wheat is an important factor in its causation; that the disease is found chiefly among the poor, and that debt is an important factor in causation. Under certain circumstances lathyrus is a good article of diet, and it is only when the proportion reaches or exceeds one-half of the whole ration that paralysis is likely to occur. The numerous theories which have been advanced to account for the curious distribution of lathyrism owe their origin mainly to the fact that the 'time' and the 'quantity' factors had not received due consideration. There is no proof that roasting or washing removes the poison; there is no proof that the poison lies in the husk, or that the poison is of the nature of an ergot, or that one kind of lathyrus is poisonous while another kind is not. The mixtures are special sources of danger. The grain is specially injurious to horses." *

ANTI-MALARIAL SANITATION IN INDIA.

THE discussion on the prophylaxis of malaria at the recent Meeting of the British Medical Association at Oxford, as reported in full in the Journal of September 1904, is of exceptional interest and importance. We would direct the special attention of our readers to the paper by Dr. J. W. W. Stephens, and to those by Major R. Ross, Captain James and Lieutenant Christophers I.M.S., on the results of the anti-malarial campaign at Mian Mir.

The first point emphasised by Stephens is that all the anophelines do not transmit malaria, but only certain species, hence in India if we could only differentate them it would only be necessary (according to our present knowledge) to wage war against three species, *viz.*, A. listoni, A. culicifacies and probably A. maculipalpis. It is admittedly

* It may be worth noting that the patient whose case was reported by the present writer in *Journal of Tropical Medicine*, May 1899, and whose portrait now appears in Scheube's *Diseases of Warm Climates* (2nd Ed.) was recently seen and was found to have almost completely recovered the use of his limbs, after 5 years regular feeding in jail. This photograph will show the "crossed-legged progression," mentioned above.—ED., *I. M. G.*

* How many cases of that somewhat vague disease of horses known as *kumri* or "gone in the loins" is due to the use of this grain by horses, owing to tricks of the syces, and how few horse owners would recognise *kesari* when they see it?—ED., *I. M. G.*

the work of an expert to differentiate these species, that is to say everyone who may have to try to wage war against the mosquito is not competent to make this distinction. Hence the importance of these observations of Stephens and Christophers which have taught us the breeding grounds of these species. Whereas the A. Rossii is extremely numerous, it is harmless as regards malaria, in Bengal at least, if not in all parts of India. This is the mosquito which loves to breed in shallow pools and puddles, but apparently, as far as malaria goes, we may leave it alone. Not so however with the A. culicifacies; it never breeds in dirty puddles, it loves clear fresh water of streams, rivers, canals, and other moving waters, where it occurs in myriads. The habits then of any malaria-bearing mosquito in any area must be studied, and it is probable that the observations of one place may not apply altogther to another place.

Then comes the question of the length of flight of the dangerous species, this is of importance, for it was the influx of mosquitoes from without that went far to spoil the results of the experiment at Mian Mir.

As to anti-larval measures—Mosquitoes breed in water, therefore if we can remove the water the mosquitoes cannot breed. This can most thoroughly be done by regular and systemic drainage, assisted, as a temporary make-shift, by "petrolage" (as the new expression is for tarring or oiling sheets of water).

Dr. Stephens goes on to show that the really only reliable test of the success of any anti-malarial measures is a reduction in the endemic index, that is, a reduction in the number of children in a given area infected, as proved by blood examinations.

On the matter of wire gauze protection, Dr. Stephens has not much to say beyond calling our attention to the success of this method in Italy. As to quinine prophylaxis we agree with him that its applicability must necessarily be somewhat limited. We are glad to see that he approved of the method of "gramme prophylaxis" (*i.e.*, 15-grain doses on two successive days weekly.) As Dr. Stephens was one of those to confirm Koch's view of the quinine origin of black-water fever, it is of interest to note that he now tells us that with the large doses of quinine there is no danger of producing black-water (a fact that a very considerable experience of quinine prophylaxis convinced us of long ago). It is, says Dr. Stephens, among those suffering from malaria and insufficiently protected by quinine, that there is danger of black-water fever.

On the Mian Mir results Dr. Stephens points to the unfortunate factor of the flight of mosquitoes from without, as one of the causes of the failures there.

The paper by James and Christophers, while admitting the failure at Mian Mir, and pointing out the difficulties of such work, boldly challenge the published results in other places, and they find it difficult to explain "the easy and triumphant successes" in other places, thereby echoing an uneasy feeling which must have passed through the minds of many who have followed the subject during the past couple of years.

On the other hand, we are bound to admit that Major Ross, in his severe criticism of the Mian Mir reports, has much on his side.

He is on sound ground when he criticises the amount of money expended on these experiments. To do such work thoroughly needs money, and plenty of money. A place like Mian Mir will not be made healthy for the expenditure of a few thousand rupees, but when we consider the cost of the British and Native troops in that cantonment, and the loss which must annually result from inefficiency and sickness due to these fevers, not to say the loss by death, as there are many cases of the pernicious types of malaria there, the expenditure on the operations there was a mere trifle. We may quote Major Ross' conclusions in his own words:

"(1) We are not convinced that mosquito propagation at Mian Mir was really suppressed to the extent claimed, even over the small radius of half a mile; (2) the test employed for detecting reduction in the number of mosquitoes consisted of nothing but the formation of a personal impression unsupported by definite figures, and was therefore neither delicate enough nor convincing enough for the purposes of a formal and important experiment like this one; (3) the figures given regarding variations in the amount of malaria are not sufficient to enable us to form any opinion one way or another; (4) several of the statements contained in the reports appear either to be contradictory or unintelligible, or to involve mathematical impossibilities; (5) even if we admit the thoroughness of the work done and the validity of the tests used, the whole experiment is still open to the final criticism (*a*) that it might not have been continued long enough, and (*b*) that the radius of operations might not have been large enough.

I therefore think that the sweeping conclusions placed at the end of Lieutenant Christophers' report are not supported by the evidence which he and Captain James

have published. They are not entitled to claim any more than is contained in the following sentence: That after operations extending to a half-mile radius, lasting a year and a half, and (apparently) costing between two and three hundred pounds, no very large reduction in the number of mosquitoes or in the amount of malaria was, judging wholly by their own personal impressions, effected. I can quite believe it."

We think that the admitted failure of the Mian Mir measures may be fairly summed up up as follows :—

(1) They were attempted on a scale inadequate to the magnitude of the evil.

(2) It was a mistake to treat only one portion of the cantonment, as the whole station is one, and is subject to the same influences.

(3) The great and important question of irrigation was hardly touched. As long as irrigation remains in the neighbourhood of this cantonment, we can hardly expect any real success in operations against malaria.

As irrigation has been mentioned, we need hardly say that no sane person objects to irrigation, as the great and important means of combating famine; what must, however, be faced is the question of irrigation in the neighbourhood of important cantonment and civil stations. If this exists, we must have malaria. What is wanted is an enquiry into this point, and a determination of the distance at which irrigation can only be allowed in the neighbourhood of all cantonments and civil stations.

LONDON LETTER.

SOME INDIAN FRIENDS AND ACQUAINTANCES.

UNDER this title Lieutenant-Colonel D. D. Cunningham, C.I.E., F.R.S., has published a most interesting book, which ought to be read by every one, and who does not, who strives to make life a pleasure in India. The book is "A Study of the Ways of Birds and other Animals frequenting Indian Streets and Gardens." It displays in every line the results of keen and sympathetic observation combined with a fine sense of the artistic and picturesque and associated with a healthy under-current of philosophic thought. Cunningham's patient industry and great power of application and his faculty of clear and logical description in scientific research are well known; but the heart and poetry which illuminate this record are a revelation. From the moment of his landing in India till the hour of his departure, he found material for delightful study in watching birds and beasts and studying the problems of their adaptation to their environment. Though most of his service was spent in and around Calcutta, his duties gave him occasion to visit many parts of India, and he was thus enabled to compare his habitual house experiences with foreign conditions. He is a thorough naturalist, and must have been born and bred so. His eyes and mind were open to studies of this kind before he went to India, and no doubt his retirement has been sweetened by similar pursuits. He kept voluminous notes of his Indian seeings and thinkings, and this book is a systematic compilation from these, illustrated by excellent photographs and drawings also executed by himself. The author is evidently a good botanist as well as an accomplished zoologist, and the interrelations between animals and plants are well brought out. He has also an appreciative eye for effect and describes plumage, foliage, blossom and scenery with the glow of the true artist. Altogether the work is a most fascinating one. I only wish I had read it before going to India in place of seeing it so long after leaving the scenes and incidents so vividly portrayed. Its perusal now gives almost a painful sense of past blindness and arouses a longing, mostly vain, attempt to recall and realize the interests and beauties displayed. I strongly advise everyone residing or proceeding to reside in India to add this delightful volume to his equipment and to use it for the purpose which evidently gained so much pleasure and profit for its author.

ROBERT KOCH.

The retirement of Professor Koch from the office of Director of the Institute for Infectious Diseases at Berlin has been made the occasion of laudatory press notices. Koch's age is only 61, and he seemed, when I met him in Calcutta in 1884, to be a man of good physique. The cause of his retirement is not made public, but it is to be hoped that he will continue to work for many years to come at those subjects in which he has made so many and brilliant discoveries. His name is chiefly associated with tubercle and cholera, on the causation and pathology of which he threw such a strong and welcome light, but his industry and genius spread over a very wide range of pathological etiology, and though in some matters and on some occasions he seemed to rush at conclusions without sufficient basis of proof, he has undoubtedly contributed powerfully to the

advance of medical science, both by the elaboration of new methods and by the elucidation of fresh facts. Whether right or wrong his work has always had a stimulating influence on other workers, and even if his record of usefulness is now closed he has attained a monumental place among medical scientists. The spirit infused by men of this sort is often more valuable than their actual productions, which are certain to be more or less eroded or engulfed as the tide of scientific research rolls on.

THE LATE NEILS RYBERG FINSEN, M.D.

The name of Finsen is associated with the light treatment, of which he was the inventor. He was a native of the Faroe Islands, was born in 1860, and graduated in 1890. He was a delicate man and carried on his researches and work under great physical difficulties. Seizing hold of the idea, which has long been floating before the profession, that light possesses curative properties, he proceeded to investigate and apply these. He experimented on the influence which light exercises on physiological processes, and analysing it, sought to find out what rays were effective in killing bacteria and causing inflammation. He found that the so-called chemical rays—blue, violet, and extra-violet—were effective for that purpose. His first application of this fact was the shutting off of these rays in cases of variola and other eruptive fevers, and he found that resolution of the dermatitis in such cases proceeded more rapidly under such circumstances. He next applied the bactericidal and phlogogenous rays to cases of lupus. These were intensified and the heat rays mitigated by a special apparatus which he devised. An institute was founded at Copenhagen through the liberality of two wealthy citizens, of which he was appointed director. Up to the time of his death, some 1,800 had been treated in this institution, and in the great majority of cases a cure or marked change for the better had been obtained. The treatment was found to be more successful in cases of lupus vulgaris than in cases of lupus erythematosus. The system, which is easily carried out, has been extensively tried in hospitals in this and other countries, though not perhaps with equal success. The light and ray treatment of skin diseases has no doubt come to remain, but much testing is still needed in order to determine its scope and value. A good deal of somewhat vague and wild experimentation is being carried on, and the element of quackery is in evidence in some instances. This constituted no part of Finsen's work. He was earnest and honest, and his name will abide as a pioneer in a department of therapeutics which promises to have a great and beneficial future.

THE LATE SURGEON-GENERAL JAMES JAMESON, M.D., C.B.

The death of this distinguished and popular officer, which recently took place at the age of sixty-seven, will have surprised many who knew him and were acquainted with his robust physique and strong vitality. His fatal illness appears to have been caused by phlebitis set up while fishing in Lapland. He saw no war service, but accompanied the British ambulance during the Franco-German war, the Seige of Paris and the Campaign on the Loire. He was devoted to his profession and a favourite in the army. During his tenure of the office of Director-General, and largely through his instrumentality, the Royal Army Medical Corps was organised, and the great burden of making provision of men and materials for the Boer War, fell upon him. In this, in spite of great difficulties, he was eminently successful. Notwithstanding his success, which is well known and generally acknowledged, he was made a scapegoat when serious charges were brought by Mr. Burdett-Coutts against South African hospital arrangements. He was practically retired and denied the K.C.B., which most, if not all, of his predecessors had obtained during or after tenure of the office. The medical profession resented these slights and awarded him that commendation which it was felt he so fully merited. The tone of the obituary notices which have appeared in the medical journals reflects the same feeling. Jameson had a charming personality, and while possessed of a strong staunch Scottish tenacity of purpose, he was likewise endowed with a liberal share of Scottish shrewdness and humour. He was an excellent speaker, and his after-dinner speeches were eloquent and racy.

FRENCH DOCTORS IN LONDON.

A very interesting recent event was the arrival of some 150 French physicians and surgeons in London for the purpose of seeing something of metropolitan medical institutions and men. They arrived on Sunday, 9th instant, and remained till Wednesday, 12th. The three days were spent in seeing hospitals and laboratories. Arrangements were made for their hospitable

entertainment, and the visit terminated with a great banquet, at which warm protestations were made of mutual esteem and regard.

There is every reason to believe that the guests were thoroughly gratified with the manner of their reception and fully appreciated all that they saw and heard.

The interchange of pleasant courtesies must strengthen the sense of catholicity of the medical profession and furnish another link of amity between the French and British nations.

K. McL.

29*th October*, 1904.

Current Topics.

BURNING FOOT OR ERYTHROMELALGIA TROPICA.

DR. P. N. GERRARD, who has recently published an excellent booklet on beri-beri, has an interesting article (*Dublin J. of Med. Sci.*, September) on this affection, based on his experiences at Selangor in the Malay States.

He defines it as follows:—

A disease of the plantar nervous or arterial supply which occurs in Eastern natives accustomed to work barefooted on roads and plantations. This disease, which is fairly common in the Malay Peninsula, chiefly in the persons of Tamil labourers upon coffee plantations, commences usually with a "pins-and-needles" sensation affecting the soles of the feet. It then progresses to an acute burning sensation, which is in the majority of cases so severe as to prevent the patient walking, and frequently necessitates the administration of narcotics to produce sleep (which becomes quite impossible in severe cases). In some cases the patient is enabled to walk upon the hills with the aid of a stick, in some others no progress nor attempt can be made.

He inclines to the view that it is a malarial neuritis. The duration of the disease is very variable; in Gerrard's six reported cases it varied from seven days to three months.

That the heat of the ground is a factor is probable from the following remarks of Dr. Gerrard:—

Regarding Dr. Savill's hypotheses as to causation—eliminating the suggestion of its malarial origin, which I believe worthy of further investigation—*arteriole fatigue* must be considered as an extremely probable factor in the tropical cases. The duties of coffee-estate coolies lead them barefooted out into the morning mists, when the upturned soil is clammy, damp, and comparatively cold, at 6 A.M.; they work on during the rising morning until 9-30, at which time they "break off" for an hour. Their next "spell," from 10-30 to 1 P.M., is on the burning soil, which is, however, during the earlier hours interrupted at intervals by cold patches of earth shaded by the still slanting rays striking the coffee-bushes. The next shift is usually from 2 to 5 P.M., during which there is no respite for the sole from the burning earth.

The affection is common in Burma, Siam, Penang and Singapore; some authors have attributed to it a malarial origin, others think it is akin to beri-beri. The disease is difficult to treat and recovery seldom takes place.

THE NEW BOVINE LYMPH DEPOT IN THE UNITED PROVINCES.

THE new calf lymph depôt was eventually opened this summer after a delay, for which the Sanitary Department of the Provinces was not responsible.

It is situated in the Kumaun hills at Patwa Dangar, 6½ miles south-west of Naini Tal, at an elevation of 5,200 feet. The site is a good one as it is secluded, on the edge of a cliff, away from traffic and habitation and exposed to thorough ventilation. The question of a site for a vaccine depôt is always difficult as work must be continuous all the year round. Extremes of cold and heat have therefore to be avoided, while the important question of efficient supervision must be provided for.

The selected site fulfils all the requirements of an institution of this sort; the main water-supply, which is a piped one, is everything that can be desired, while a spring close by is available when required.

The whole estate comprising about 7½ acres, is enclosed in a barbed wire ring fence—a very necessary precaution owing to rinderpest being common in the Kumaun hills. The buildings comprise (1) an operation room and laboratory combined; (2) stalls for healthy calves; (3) stalls for vaccinated calves; (4) Assistant-Surgeon's quarters; (5) Vaccinator's quarters; (6) coolie lines; (7) inspection bungalow and out-houses. Besides these there are wood and grass depôts—*bania's* shop and post office. The cost of erection was about half a lakh of rupees. From the above it will be seen that the institution is practically self-contained, and as it is away from human habitations there is not much chance of outside infection.

The operation room will be supplied with all the latest appliances, and in the attached laboratory sterilising and mixing is performed, while plating out and other bacteriological tests can be conducted in an adjoining room. At present admixture with glycerin is the medium chiefly employed for conservation, and it is hoped to test shortly the value of the new method of killing extraneous germs with chloroform vapour. Considerable difficulty is experienced in obtaining calves as the hill people are prejudiced against the procedure of vaccinating calves, and in spite of a liberal price paid for the hire of bovines they will not readily produce either cow or buffalo calves.

The production of glycerinated calf lymph by this depôt will, it is hoped, eventually admit of the total supercession of arm to arm vaccination; but the introduction can only be gradual as the supply is limited by the supply of calves which at present is unsatisfactory. The

vaccination work in the United Provinces has been built up to its present eminently satisfactory position by a gradual process which can only with great caution be interfered with—even with the best intentions and for the benefit of the community.

Last year 1,667,104 vaccinations were performed in the United Provinces by 917 vaccinators, at a cost of Re. 0-1-2 (one anna two pies) per vaccination.

has been observed among hogs, sheep, goats, and bovine animals.

The chronicles of epidemics of years gone by speak of the dying of birds in great numbers. At Yunnan the domestic fowl is reputed infectible, and recently at Bombay, during plague, many pigeons died. On the contrary, at Hongkong an augmentation of deaths among domestic fowls and pigeons has not been determined.

In the Himalaya Mountains it is believed that serpents devouring plague-infected rats die from the disease, but observations made by Plank in 1877 cast doubt on this story."

STONE OPERATIONS IN 1903.

	Punjab.	Bengal.	U. P.	Madras	Burma.	Assam.
I. Lithotomy—*a*. Suprapubic	11	3	63	...	...	..
b. Lateral perineal	171	7	303	59	1	18
c. Median	20		23		2	
d. Vaginal	5	...	3	...	4	..
II. Lithotrity	6	...	44	2	19	...
III. Litholapaxy	1,885	15	566	2	40	1
Perineal	12	...	...	...	...	...
IV. Dilatation of female urethra	2	11	...	7	...	1
V Urethral calculi	196	8	...	131	3	31
TOTAL ...	2,308	44	1,002	201	69	51

ANIMALS AND PLAGUE INFECTION.

DR. P. VINCENTI of Naples in a work recently published reviews the question of animals and plague infection. We may omit his remarks on rats and plague as the connection is well known. Dr. Vincenti continues:—

"Though susceptible in the laboratory, observations are very sparse showing the infection of mice under natural conditions. Squirrels have been found dead with the disease in India, where this animal is common. Guinea-pigs are not affected except artificially. At Mysore, India, a porcupine was bacteriologically shown to have died of bubonic plague.

One species of marmot, in eastern Mongolia, is subject to a considerable mortality almost every year from plague. There is evidence also that moles are agents

On three occasions, all in India, prevalences of disease among monkeys have been proved bacteriologically to be bubonic plague.

Though laboratory experiments are almost constantly negative regarding the susceptibility of dogs to plague, there is historical evidence that, during prevalences of so-called plague in England, Russia, and Asia, there was a concurrent epizootic among dogs. In 1897-98, at Poona, two dogs in military barracks were suspected, but not proved to have died of plague. At Jeddo it is said there was, during the plague of 1897-98, a large mortality among dogs. On the other hand, at Bombay, in the autumn of 1890, when plague prevailed, the deaths among dogs were below the mean.

Augmentation of the number of deaths among cats has been recorded in recent epidemics of plague in Asia.

It is said that in China jackals preying on human plague cadavers die also of the disease. However, proof is lacking.

No cases are recorded of horses falling victims to plague, but in many epidemics an increased death-rate

FALLACIES IN VITAL STATISTICS.

REFERRING in the *Medical Record* (23rd July, 1904) to some of the many sources of error which detract from the value of vital statistics as premises capable of leading to logical deductions, Dr. T. L. Wachenheim, of New York, lays some stress upon the errors which prevail with regard to the relative increase and decrease of certain diseases.

Regarding cancer, for example, the published figures for the whole of the United States shows an advance of 30 per cent. in one decade in the incidence of the disease; but to accept this as the full limit of increase would be fallacious, because, during the same decade, the proportion of individuals of 45 years and over has increased 4·7 per cent., and cancer being a disease of advanced life, its natural increase during the period might be set at 4·7 per cent., thus reducing the apparent growth to 24·5 per cent. Even this cannot be accepted as final, for during the particular decade fewer deaths from unspecified tumours were returned than in the previous one, and, on the reasonable assumption that most of such were cancerous, taking the actual figures, a further reduction in the growth can be effected to 14·2 per cent.

"Great," the writer states, "as the reduction is from 30 to 14·2 per cent., it does not tell the whole story." It is highly improbable that the remarkable diagnostic progress which has characterized the last decade has resulted in fewer cases of the stomach being overlooked

than previously, and it would not be surprising, were it possible to overhaul the old statistics of death from unspecified diseases of that organ, if we were to find that after all the dreaded increase does not exist.

With regard to malarial fever, published statistics show a falling off during the last decade in the whole registration area of 54 per cent. This is attributed to improved sanitation. Turning however to typhoid fever, the best sanitary index, there was only a reduction of 27 per cent. in the mortality despite the fact that improvements in treatment have very materially reduced the relative death-rate from this affection. A much more probable explanation lies in the fact that in the previous decade the microscopical determination of the malarial parasite was very rarely made, and, judging from the facts that many deaths from malaria were reported from districts where fatal malaria is practically unknown, it is extremely likely that deaths due to undiagnosed typhoid were attributed to malaria.

Notwithstanding these possibilities we can hardly agree with Dr. Wachenheim in his denunciation that mortality tables are merely plausible and have not the faintest trace of scientific value, nor in his hope that some day the blind worship of the fetish of crude vital statistics will be relegated to the limbs of other pseudo-scientific superstitions. *Per se* mortality tables are insufficient to justify any deduction. Premises have to be made by considering them together with all other factors bearing on the conclusion sought for so as to eliminate all sources of error. Without them our premises would be incomplete and syllogisms impossible.

SYPHILIS AND MARRIAGE.

IN a paper upon syphilis in its relation to marriage (*Med. Times*, August 1904) Dr. Shellenberg holds that, excepting certain cases which baffle all therapeutic efforts, an infected person treated with method, energy and perseverance, should not have a tertiary period, and that specific treatment diminishes and suppresses the chances of contagion in marriage, and also the hereditary risks of syphilis.

"For a child," he writes, "to be born healthy of syphilitic parents, it is sufficient that these parents are subjected to mercurial influence at the times of its procreation. However singular, however paradoxical, and above all however inexplicable such a fact may at first glance appear, it would seem to be evident from a certain number of well authenticated cases." But "in order that a syphilitic patient may have the moral right to become husband, father, and support of a family, it is indispensable that he shall, by virtue of a treatment sufficiently protective, have ceased to be dangerous to his wife, his children and himself."

The question here naturally arises as to what is "sufficiently protective." A chronic disease requires chronic treatment, and Fournier's standard might well be followed in every case. This is based upon the administration of mercury and the iodide of potassium in veritably active and curative doses, prescribed according to a method having for its aim the conservation of their primitive intensity of action (*e.g.*, intermittent or successive treatments) notwithstanding a course of treatment which must be vigorously pursued for at least three or four years.

The immunity from manifestations which often appears after treatment for some months or even a year or two, Dr. Shellenberg reminds us, is quite compatible with the diathesis remaining latent to assume potential energy at some subsequent period. No less than three or four years, therefore, should be devoted to anti-syphilitic treatment, however mild the primary manifestations; and prudence dictates that, thereafter, the patient should subject himself every two or three years to a new iodide treatment so as to complete the destruction of the diathesis, or to keep it in check and thus hold the ground gained.

He considers the best way of administering mercury internally is in solution, in small and frequently repeated doses, not only to obviate the intestinal irritation which large doses cause, but because the almost universal opinion of syphilographers is that the activity of a given dose of a mercurial solution is much increased by giving it divided several times during the day over that exhibited by giving it all in a single administration.

A HEALTH EXHIBITION IN BOMBAY.

A SPECIAL section will be devoted to Sanitary appliances and apparatus and personal and domestic Hygiene and Science in relation to Hygiene at the Industrial and Agricultural Exhibition to be held in Bombay in December 1904.

1. Water-supplies and filtration.
2. Drainage and the modern system of sewage disposal.
3. Infectious Diseases and their prevention: disinfection.
4. Ventilation of buildings and factories.
5. Modern sanitary appliances.
6. Food and Milk: their values and preservation.
7. Conservancy and Refuse Disposal.
8. Model dwellings.
9. Literature relating to sanitation.

During the Exhibition demonstrations and lectures will be given on appliances and apparatus and the application of science to Hygiene including Tropical Sanitation and Hygiene by the aid of illustrations, lime light, microscopic and lantern demonstrations. All communications to be addressed to Dr. J. A. Turner, Health Officer, Bombay.

ST. BARTHOLOMEW'S HOSPITAL, OOTACAMUND.

The Managing Committee of St. Bartholomew's Hospital, Ootacamund, has had for some time under consideration the structural improvement of the Robinson (private) wards. These wards were built in 1876, but they are narrow and dark and unsuited for serious cases requiring prolonged treatment in hospital. Want of the necessary funds has so far prevented steps being taken to radically alter them to suit modern requirements, but now the generosity of three contributors has enabled the Committee to take the work in hand without further delay. His Highness the Nizam of Hyderabad has sent through Lady Price a donation of Rs. 1,000 for the alterations in one of the wards. Her Highness the Kumarika Maharanee of Vizianagram has contributed Rs. 200 for the same purpose, also through Lady Price. And recently His Highness the Maharajah of Mysore has given Rs. 1,000 for the alterations in the other ward. All three donors had on previous occasions subscribed liberally to the Hospital funds, and this continued interest on their part in the institution is very gratifying to the Hospital authorities, and will prove of lasting benefit to the sick among the residents and visitors of the station of all classes. The Committee also acknowledges gratefully the endowment of one bed in the Hospital in perpetuity (to be called the Parlakimedi Bed) through the generosity of the Rajah of Parlakimedi, who sent for this purpose the splendid sum of Rs. 3,500,

On Saturday, the 15th instant, Their Excellencies Sir James and Lady Thomson visited the Hospital and recorded their satisfaction with the way in which the sick were cared for, and their pleasure in visiting the institution. Among others who visited it and expressed similar satisfaction recently were His Lordship the Bishop and Surgeon-General Browne.—*Madras Mail.*

THE TYROL AS A HEALTH RESORT FOR ANGLO-INDIANS.

For no one is it of greater importance than for the Anglo-Indian when he returns to Europe, for reparation of his health, to know what climate would be most suitable for his purpose. The dangers and melancholy uncertainties of an English winter are well known, and plans must therefore often be made to avoid it. We quote a well known Medical Officer in India, who has spent some time at the Capital of Tyrol, and who speaks thus of its climate: "While there are no people in the world so dependent on a suitable change of climate for the preservation and reparation of their health as Anglo-Indians, I am afraid it can be truly said, that there are no people in Europe of the same class so little acquainted with the best resorts wherein to take it. To them the choice seems to be limited to three or four spots, the stereotyped round, handed down for generations: the Riviera towns, or the slopes above the Lake of Geneva. These have their important merits no doubt. But for those with whom health considerations are in the ascendant, the absence of elevation is a serious loss." It is for this reason that the Medical Officer just quoted, recommends the various resorts in the Eastern Alps, and especially Innsbruck, the Capital of Tyrol, which lies about 2,000 feet above the sea-level. Hotel accommodation is excellent and up-to-date, and charges very moderate. In conclusion of these few remarks, we may again quote the same Medical authority and repeat the very words by which he describes the view from his window, at the Hotel Tyrol: "The whole visible world before me is under snow. Our low-land appreciations of distances call for new standards in an atmosphere like this. The splendid pile of the Waldrast, 8,908 feet, that really springs from the slopes of the Bredner more than twelve miles off, seems to raise its giant form from the end of the opposite street. It stands forth from the hotel window, snow clad, luminous with sunshine, seamed with appropriate shadow along its glooms of precipitous crevasses, and crowned with a wraith of a lost cloud, a circling fillet of pure white floss, as becomes the Monarch of the Sierra. Snow is everywhere weighing down the vast forests of pine that stretch up along every crag to the line where vegetation ceases. The frozen snow is on my windows, which are both thrown open as on a summer's day. There were 14 degrees of frost last night, and now at 10 A.M. there is no sign of thaw. Yet with over twenty years of India to poison the blood and embarrass the circulation, the frost, dry, sparkling, invigorating and indeed exhilarating in the last degree, communicates no phantom of a chill, so dry, warm and generous is the sunshine, so perfect the radiation, so dry and sweet and so motionless the air."

It has long been taught that syphilis does not affect animals. We learn however (*Berl. Kln Wochcn.*) that Dr. O. Lassar has succeeded in successfully inoculating two chimpanzees with human syphilis. The primary sore healed completely, and the syphilitic lesions developed later on brow, arm, hand and soles. Similar experiments are being conducted at the Pasteur Institute, Paris.

The following figures show what the aseptic system can effect in midwifery in well-managed institutions:—

"1. *Mortality at the Rotunda Hospital.*—During the last two years (ending November 1st, 1902, and November 1st, 1903) there were 3,370 intern cases with 15 deaths, and 4,233 extern cases with 9 deaths—that is, out of a total of 7,603 there were 24 deaths, or a mortality of 0·32 per cent., and of these 24 deaths 8 were

due to sepsis (puerperal infection)—that is, a mortality of 0·1 per cent.

2. *Mortality at the Belfast Maternity Hospital.*—During the last two years (1902 and 1903) there were 638 intern cases, with 2 deaths, and 555 cases in the extern maternity, with 2 deaths—that is, a mortality of 4 in 1,193 cases, or 0·33 per cent., and none of the deaths were caused by puerperal infection.

Adding together the cases from these two Irish maternities, we have a total of 8,796 cases, with 28 deaths, or a total mortality of 0·31 per cent., and a mortality from sepsis (puerperal infection) of 0·09."

Two recent sensational cases in Germany, the Dippold and the Prince Arenberg cases, have focussed public attention on the questions of diminished responsibility and the socially dangerous insane. Several important works have been published on the subject, and the tenth conference of the German branch of the International Association for the study of criminology adopted a set of resolutions at the Stuttgart meeting in May. The lawyers' congress, to convene in September, has also appointed these questions for discussion. Aschaffenburg reviews the recent works and discusses the views advanced, giving the Stuttgart resolutions, which are as follows: (1) Criminals not fully responsible for their acts should receive a milder sentence. Appropriate measures to protect society should be imposed in the case of those acquitted on account of absolute lack of a sense of responsibility, as also for those whose sentence is milder on account of diminished responsibility. Similar protecting measures should be imposed on persons with diminished or lacking sense of responsibility, although they have not yet committed a crime. These protecting measures should be imposed by a special process similar to the process of the guardianship of minors. (2) The President of the International Association is commissioned to request that a law to this effect be enacted for the empire. (3) Mentally deficient prisoners should be placed under the special supervision of the physician. The physician should have the deciding voice in regard to these prisoners' disciplinary and other treatment, and also in regard to appealing for their release from the full execution of their sentence.—*J. A. M. A.*

OUR readers may remember that some time ago a writer in a London contemporary endeavoured to make out that the black ink-like marks on the tongue of natives of India were pathological, and symptomatic of disease, especially ankylostomiasis. In India they are well known, and recognised to be racial, at least not pathological, as Major F. P. Maynard, F.R.C.S., I.M.S., pointed out in these columns in 1897. Now we read that Dr. F. M. Sandwith from his large experience in Egypt comes to the same conclusion.

FROM the Report of the Army Vaccine Institute in England it appears that in the year ending 31st March 1904 vaccine sufficient for the vaccination of nearly 122,000 persons was supplied to the Army and Navy. The success percentage in the army for infants was 97·52, and for others 98·5. The revaccination rate for the army at home is put at 93·3 per cent., and for the army abroad (excluding India, we presume) at 57·3 per cent. This amount of lymph appears to have been got from only 38 calves, or 1 calf for 3,209 vaccinations. During the present year lymph is being issued in tubes, "one man, one tube," the lymph mixed with glycerin and sterile water, the admixture of water rendering the lymph more fluid, and is in no way detrimental to its efficacy.

A BILL has been introduced in the New York State legislature which goes farther than any other for the prevention of the use of cocaine. It forbids the sale of cocaine either at wholesale or retail in any form or in any proprietary preparations, except on the written prescription of a duly registered physician or dentist, and any preparation of cocaine or its salts must have a label affixed to the bottle giving the exact contents of the mixture. To judge by the number of prosecutions for the illegal sale of cocaine in Calcutta, it is apparent that there still exist a very large demand for this drug, as an euphoric to be eaten along with *pan*.

DR. ROSENTHAL has elaborated a serum, by immunizing horses against the toxin of dysentery, which he used during an epidemic in the fall of 1903. One hundred and fifty-seven cases were treated, in forty of which the bacillus of dysentery was sought and found. Each patient received from five drachms to four and one-half ounces of the serum subcutaneously. The injection was painless, but in 13 per cent. of the cases was followed by an erythema; in four cases by urticaria; by arthralgia in two cases. There were eight deaths, three of which were due to other infections. All the patients entered the hospital after having been ill for a week or less, and were in the later stages of the disease. The mortality was 4½ per cent., as against from 12 to 17 per cent. in cases not treated by the serum. The serum caused all the symptoms to improve; within twenty-four hours the tenesmus diminished, the stools became fewer, and the blood disappeared. Rarely did a patient go on to the chronic stage of the infection. When the serum was used within three days of the inception of the disease recovery was established in from one to three days—*Deutsche medizinische Wochenschrift*, 1904, No. 19, p. 691.

WE quote the following from the *Glasgow Medical Journal*:—

"GLAUCOMA AFTER CATARACT EXTRACTION.—Professor Lapersonne (*Archiv. d'Ophthalm.*, 1904) calls attention to Pagenstecher's observations in which he distinguishes

(1) glaucoma coming on immediately after operation, (2) glaucoma occurring some three or four days after operation, and (3) that happening at a much later period.

The second class of cases are by far the most frequent, and are due to the abuse of atropine, to the presence of cortical matter, and, also, to the iris and capsule being caught in the wound. Further, Pagenstecher and Major Smith, I.M.S., who both extract the lens in the capsule, have recorded cases of glaucoma In other cases there seems to be a predisposition to the condition. Lapersonne seems to attribute many cases of glaucoma to an œdema of the vitreous humour which, in his opinion, largely depends on the renal permeability to chlorides. A case which he records seems of importance in this respect. A woman, aged 52, came to the Hotel Dieu with cataract. The right eye was operated on by extraction combined with iridectomy. Everything went well, and the patient was ultimately dismissed. Thirty-seven days after the operation she was seized with a violent attack of glaucoma in the eye from which the cataract had been removed, and was readmitted to the hospital. The condition yielded to treatment, but a few days afterwards there was another attack. The patient, in addition to the ordinary treatment, was given a diet free from chlorides. The general condition was one of high arterial tension, with a trace of albumen in the urine, and the methylene blue test showed a want of renal permeability.

Exact observations were made for a month, and it was observed that on two occasions, when the amount of chlorides eliminated was greatly reduced, there was an exacerbation of glaucoma. Lapersonne had no doubt that the glaucomatous attacks had a certain relationship to the amount of chlorides being eliminated."

To those interested in trypanosomiasis we commend the recently published volume by Laveran and Mesnil, entitled *Trypanosomes et Trypanosomiasis* (Paris, Masson et Cie, 1904, price 10 francs). It is indispensible for all workers in tropical medicine and the protozoa.

It may be remembered that in our London Letter in October it was noted that it was not improbable that the cholera which was prevailing badly in Persia would reach Europe. This has now happened, as the outbreak has been reported from European Russia. We learn from an American Consular report that cholera disappeared from Teheran in the last week in July. It was also pointed out that the path taken by the disease was North-West, and that it had then reached the two most important Persian Ports on the Caspian, *viz.*, Resht and Astrabad, "the two portals of European trade and traffic."

We have been requested to call attention to the new rules, dated Simla, 30th May 1904, dealing with investments in Government paper made through the Agency of the Post Office. The new rules afford greater facilities for such investments and will surely render this method more popular.

An editorial in *Journal* of R. A. M. C. states that the percentage of rejections of recruits on account of loss or decay of teeth has risen steadily from 10 per mille in 1891 to no less than 63 per mille in 1903. This is an enormous number rejected on this account alone, and suggests that some definite rules should be laid down to guide the medical officer in deciding on these cases.

Post graduate classes have been established at the School of Physic, Trinity College, Dublin, which are being well attended.

Out of the 27 appointments in the staff of King Edward VII's Hospital for officers, the names of the following retired officers of the services appear :—A. Crombie, I.M.S.; and P. J. Freyer, I.M.S.

In the proceedings of the Sanitary Commissioner, Madras, for 3rd and 4th quarters of 1903, will be found notes on the following subjects, which may be useful to Civil Surgeons :—

(1) Suggestions for prevention of cholera (pp. 207—213).
(2) Anti-malarial instructions (pp. 202—203).
(3) Grain and plague infection (p. 163, &c.).
(4) Wet cultivation within Municipal limits (p. 230, &c.).

Messrs. Lingard and Jennings discovered, during the month of October in several cases in the peripheral circulation of human beings, very small organisms which exhibit the characteristics of the Trypanosomidæ. Each one possesses a micro and a macro-nucleus, but up to date no parasites of this class have been observed presenting undulating membranes. These organisms are generally from 5 to 10 micra in length, but the majority of them only average about the former measurement. Being present in but small numbers and being minute, the undulating membrane may have been obscured and overlooked, so it may be found to exist in future specimens.

Associated with the above in the blood of the same patients, other organisms, bearing a marked resemblance to Trypanosomes, were also observed, but each of these latter forms presented a flagellum at either extremity, an undulating membrane, together with what appeared to be micro-and macro-nuclei respectively. These organisms, however, do not resemble the Trypanoplasma of fish described by Borreli.

An enquiry is being made to ascertain if temperature reaction after inoculation is any indication of the acquirement of immunity. It is well known that some individuals who are inoculated show very little fever; others who may be inoculated with the same material and the same dose, show considerable fever. Mr. Haffkine has stated that "a temperature of 101°F. is an indication of a sufficient reaction, and of a sufficient protection conferred on the inoculated." An

attempt is now being made to collect some evidence on this point and the assistance of medical officers in the matter will be much appreciated.

Replies should be addressed to the Director, Plague Research Laboratory, Parel, Bombay, who will gladly correspond with anyone desiring further information.

Mr. Eugen Sandow the famous exponent of physical culture, gave a special demonstration of his methods to members of the medical profession in Calcutta on 15th November. The lecture was largely attended and all were deeply interested. We strongly recommend medical men who may have an opportunity of seeing Mr. Sandow during his tour up-country not to miss the opportunity. Mr. Sandow is most courteous in answering all and any questions put to him about his methods.

Reviews.

Diseases of the Stomach and their Surgical Treatment.—By A. W. Mayo Robson, F.R.C.S., and B. G. A. Moynihan, M.S. (Lond.), F.R.C.S. P. XIV and 508. Illustrations 108, Demy 8vo. 15*s.* net. Balliere, Tindall and Cox, 8, Henrietta St., London, W. C.

During the two years that have elapsed between the publication of the first edition of this book, the amount of work published on this subject has been so great that the authors have been forced to rewrite the greater portion. The first chapter deals with the anatomy of the organ and the second with diagnosis; the various points and the methods for estimating the acidity of the gastric juice, the motor activity of the organ, etc, are well described.

Gastrotomy and the indications for its performance, are next dealt with. An interesting chapter on congenital hypertrophic stenosis of the pylorus with the various views of its etiology then follows; the authors are at present unable to decide which is the best operatve procedure in these cases. In recent cases of severe ulceration of the stomach, due to the swallowing of caustic fluids, gastrotomy combined with a gastro-enterostomy is recommended, the patient being fed directly into the jejunum until the healing of the raw surface is complete.

Cancer of the stomach is very fully dealt with, the points of emphasis from the surgical standpoint being emphasied. The authors strongly urge that an exploratory incision should be more freely employed, and that "cancer of the stomach should be dealt with surgically before a tumuor is clinically recognisable." The choice between gastrotomy and gastro-enterostomy is fully discussed; the statistics of various operators being considered. Gastrotomy is given as the operation of choice even when only a palliative operation is intended, gastro-enterostomy if the growth is causing pyloric obstruction, or there is hourglass contraction or stasis of the contents will give marked relief; but on the other hand, in those cases where the growth is confined to one or other curvature, and obstruction and stasis are not present, there will be little or no relief. The operations of gastrectomy, gastrotomy and jugurostomy are fully described.

The subject of gastric ulcer and the theories of its causation, occupy the next important chapter; the authors believe that they are for the most part septic in origin, and oral sepsis is responsible for many cases. Methods of medical treatment are given, stress being laid on the importance of rest in bed; for surgical treatment of the chronic ulcer, earlier operation is recommended; excision of the ulcer is looked upon as being as a rule unnecessary, the authors pinning their faith to a posterior gastro-enterostomy in the majority of cases.

The indications and the various methods of performing gastro-enterostomy are admirably described.

In the treatment of hæmorrhage from gastric ulcer, medical means failing and the probability being that the bleeding is from a large vessel in connection with a chronic ulcer, operation is recommended; if the ulcer can be felt on the anterior wall, where it can be easily reached, then excision combined with gastro-enterostomy is recommended, if at the pylorus, and not many adhesions, pylorectomy is the better operation, but if no sign of ulceration can be detected then a simple gastro-enterostomy is advised. Ligature of the bleeding portion fails on account of the friability of the tissues.

Perforation of gastric and duodenal ulcers, acute and chronic dilatation of the stomach, hour-glass stomach and other disorders are discussed in the remaining chapters.

Many illustrative cases are included in the text, both of the authors' own, and from current literature. The book is a complete resumé of the subject, and is of a high standard of excellence. The illustrations and printing are also good.

Scientific Memoirs, No. 12—Morphology of the Flowers of Cannabis—By Major D. Prain, M.B., I.M.S.

We cannot pretend to be able to "review" this Memoir by Major Prain, of the Royal Botanic Gardens, Sibpur, Calcutta. It deals with the structure of the flower, fruit and seed of Cannabis, a subject which has occupied the attention of botanists for a long period with results which can only be regarded as indecisive. The monograph is beautifully illustrated, and printed in the admirable way all the new series of Scientific Memoirs are.

Enlargement of the Prostate; its treatment and Radical Cure.—By C. MANSELL MOULLIN, M.D. (Oxon), F.R.C.S., 3rd Edition. Pp. XII and 204. Size 8vo. Price 6 shillings. H. K. Lewis, 136, Gower St., London.

THE first chapter deals with the character of the normal gland, its functions and development; its purely sexual character being insisted upon. The enlarged organ is then described, the histology, varieties of enlargement and the different changes in shape of the urethra are fully given. Several good plates are here figured. The various theories of the cause of the enlargement are discussed. The author holds the view that senility has little or nothing to do with it; he decides that the analogy with uterine fibromyomata cannot be accepted; also against the view that enlargement of the prostate is one of the events that occurs in the course of general atheroma, and against the theory propounded that the primary change is in the bladder and the enlargement of the prostate compensatory. The suggestion is made that the solution may be found in the relations existing between the testes, and the prostate. Succeeding chapters are devoted to the description of the effects, symptoms and diagnosis of the enlarged gland, and all these points are fully and carefully treated. A useful chapter on general treatment begins the subject; palliative measures have in view the maintaining of a clear route through the urethra; to avoid the collection of residual urine, the occurrence of retention, and to prevent systitis. "If this can be accomplished more energetic measures are not needed." In the first of the above aims, the author has found the passage of a large sound retained for 15 minutes to be of value in some cases; strychinine is useful in maintaining the muscular power of the bladder, and if a catheter has to be habitually used, the patient should pass his urine through it as forcibly as possible with the same object. The necessity of perfect asepsis, in connection with the passage of a catheter is fully insisted upon.

Chapter X is devoted to the radical treatment of the enlargement; suprapubic prostatectomy is recommended as the operation of choice. The different methods of perineal prostatectomy, and Bottini's operation are well described. This chapter is somewhat unsatisfactory, inasmuch as little reference is made to any large series of cases operated on in recent years, and the author is perhaps not sufficiently authoritative in his conclusions. The subject of orchidectomy and other operations on the cord, concludes the book. The printing, paper and illustrations are all excellent.

HOSPITAL REPORTS.

I. PUNJAB.

THE report, submitted by Colonel J. Mc Conaghey, I.M.S., shows an increase in the attendance on hospitals and dispensaries, over that of the two previous years, and it is hoped that the reluctance to attend, which was due to the prevalence of plague, is disappearing. The attendance of out-patients also shows a distinct increase. As noted in the Sanitary Commissioner's report, the year was a malarious one, and the number of cases of 'fever' treated was considerably increased. There were no less than 162,396 surgical operations done, including 339 amputations, with 13 deaths; 5,891 cataracts, of which 4,841 were successful; 2,110 operations for stone in the bladder with 73 deaths; 102 for hernia with 7 deaths; 36 for liver abscess, 8 deaths, 40 abdominal sections with 12 deaths: 5 ovariotomies, 2 deaths; and 5 cæsarian sections with 4 deaths. We quote the following paragraphs *in extenso*:—

"A very considerable amount of surgery was done at the Jullundur and Amritsar Civil Hospitals, the Mayo Hospital, Lahore, and the Gujranwala, Mooltan, Shahpur, Sialkot and Ambala Civil Hospitals. For cataract (extraction of lens) Jullundur leads with as many as 1,446, followed by Amritsar with 655 and the Mayo Hospital with 592. The Mooltan Civil Hospital did the largest number of calculus (stone in the bladder) operations, 167, followed by the Mayo Hospital with 123.

"16. Among the principal operators should be mentioned, in order, Major H. Smith, Civil Surgeon, Jullundur; Lieutenant-Colonel F. F. Perry, Principal and Professor of Surgery, Lahore Medical College; Lieutenant-Colonel T. R. Mulroney, Civil Surgeon, Amritsar; Major A. Coleman, Civil Surgeon, Jullundur and Gujrat; and Captain E. V. Hugo, Civil Surgeon, Sialkot. Among Assistant Surgeons, Munshi Diwan Ali, Shahpur, deserves special mention: as also Senior Hospital Assistant Pir Bakhsh of Ahmadpur, Jhang District, among the Hospital Assistants."

II. BENGAL.

There was a small decrease in the attendance at the Calcutta Medical Institutions, of which there were seventeen at work during the year. This is chiefly due to the improved health of the city durig 1903. Malarial fevers, and zymotic diseases decreased, while venereal diseases, which are independent of climate, showed a considerable increase. We quote the following remarks by the Inspector-General, Colonel S. H. Browne, C.I.E., I.M.S.:—

"The record of surgical work done in the hospitals during the year is a fairly satisfactory one, the total number of operations performed having risen from 28,385 in 1902 to 29,475. The increase occurred chiefly at the Medical College Hospital. Mere numbers, however, are not a trustworthy index of the amount of important surgical work accomplished: the fact that of the total number of operations performed, 10,160 were cases in which teeth were extracted will make this clear. Even the list of selected operations includes many of a comparatively simple and unimportant nature, so that in judging of the character of the surgical work done, it is necessary to discriminate carefully the really important and difficult operations. During the past year the following medical officers performed a large number of important operations:—Lieutenant-Colonel Murray, I.M.S. (182), Lieutenanant-Colonel Charles, I.M.S. (234), Major Maynard, I.M.S. (452), Lieutenant-Colonel Lewtas, I.M.S. (236), Major Bird, I.M.S. (174), Lieutenant-Colonel Peck, I.M.S. (70), and Assistant Surgeon Mrigendra Lal Mitra (101).

The condition of the principal hospitals at present is one of transition, much having been done towards bringing them up to modern standards whilst much remains to be done. The Presidency General Hospital, with the exception of its wards for paying patients, which are about to be rebuilt, is an efficient modern institution, well designed and equipped. The Medical College Hospital is also undergoing a process of development and modernization which had became urgently necessary. During the past year arrangements were completed for the addition of a surgical ward of 80 beds with all modern improvements. Nurses' quarters are also to be provided and much-needed improvements in the main building have been arranged for, so that this hospital will soon be worthy of its position as a great teaching institution, and the principal means of affording medical relief to the native population of Calcutta. Of the other institutions, the Campbell Hospital and the Howrah General Hospital are still much behind the times in accommodation and equipment, but arrangements have been made for their improvement, and it is hoped that they will soon be placed in a satisfactory state of efficiency. All the hospitals were inspected by my predecessor, Colonel Hendley, and myself during the year, and I have pleasure in testifying to the energy and enthusiasm with which medical officers have endeavoured to improve the efficiency of and to popularize the institutions in their charge."

In the *Mofussal*, there were open at the close of the year 597 dispensaries, an increase of 23 over the number of the previous year. At one hospital, the Durbunga Raj, there was a record attendance of 4,033 patients in one day! on the occasion of a festival. There was a falling off in malarial cases, due to the better health of the year.

On the surgical work Colonel Browne remarks as follows:—

"The number of surgical operations performed during the year was 184,420 as compared with 171,647 in 1902, an increase of 12,77 . Whilst from a numerical point of view this result is satisfactory: an examination of the returns shows that there was a decided falling off in the number of some of the more important operations performed; thus operations for cataract numbered 2,772 as compared with 3,203 in the previous year. Ovariotomies fell from 27 to 9, and operations for the radical cure of hernia from 48 to 21. It is remarkable that whilst there were 181 litholapaxies, lithotomies increased from 110, the number performed in 1902, to 131. It seems probable that in some cases lithotomy was performed because suitable apparatus for litholapaxy was not available. At all events the proportion of lithotomies to litholapaxies is much larger than that commonly recognized as necessary in the bladder surgery of to day. On the other hand, it is satisfactory to note an increase in the number of operations for elephantiasis of the penis and scrotum from 19 to 118, the great majority of these operations having been performed at Cuttack, whilst the result was successful in all but one case. Splenectomy, a very formidable operation, was performed successfully in three cases, and 58 laparotomies resulted in nine deaths only. A large amount of important surgical work was done in the Bankipore, Gaya, Durbhanga, Mitford, Cuttack, Arrah, Dumraon, and Bihar hospitals. It is satisfactory to find that a number of Assistant Surgeons have done important work of this kind: prominent amongst these are Assistant-Surgeon Rajoni Kant Das Gupta, Arrah (176 selected operations), Assistant Surgeon Hari Das Mitra, Dumraon (171), Assistant Surgeon Nil Ratan Adhikari, Kamarhati (125), Assistant Surgeon Surendra Nath Neogee, Gaya (115), Assistant-Surgeon Purna Chandra Purkait, Bihar (113). In connection with this subject it is necessary to observe that the surgical equipment of a considerable number of the hospitals is defective: instruments being of antiquated patterns: means of sterilization imperfect or non-existent; and operating rooms very unsatisfactory: in fact, medical officers have had many serious difficulties to contend with which have undoubtedly interfered seriously with efficient surgical treatment. Improvements in this direction, however, are being strenuously pushed forward in almost all the more important hospitals, and whilst already much has been accomplished, there is every reason to hope that in the near future the old order of things will have disappeared, and that the hospitals will be rendered thoroughly efficient in this respect."

III. Burma.

Two and a quarter pages of letterpress is all that is given to the notes on the statistics of the Burma Hospitals for the year 1903. Seven new dispensaries were opened, leaving a total of 134 civil medical institutions in the Province. The total number of sick treated was close on a million and showed a substantial increase over that of the previous year. Eighteen cases of beri-beri occurred among the Lightship population. We are glad to see a steady rise in the number of major operations performed, *e.g.*, amputations 133, laparotomy 40, cataract 16, lithotomy 16, lithotrity 41, litholapaxy 19, trephining 38, and herniotomy 53.

The Subordinate Medical Department has been largely undermanned, as dissatisfaction still exists among this class as to the pay and allowances, which are considered not sufficiently attractive. It appears that Indian Civil Hospital Assistants are not found satisfactory as they cannot stand the climate nor, it appears, can serve with the Military Police or with Burmans. Colonel C. C. Little, M.D., I.M.S., submits the report.

IV. Assam.

Colonel Wilkie, I.M.S., took over charge on 4th August 1903. The total number of dispensaries is 134, here also we note an increase in the in-patients and a great increase in out-patients, the highest ever recorded in Assam. As the year was a healthy one this is extremely satisfactory. We are glad to see a rise in the number of surgical operations, especially of those in the selected list. Colonel Wilkie writes:—

"The number of selected operations rose from 734 in 1902, which was the maximum previously recorded, to 790. This shows that endeavours are being made to increase the usefulness of the surgical side of our dispensaries. Major Wood did 48 operations of this class, and Major Hare 26. Assistant-Surgeon Lalit Mohan Roy did 37, Assistant-Surgeon Sarat Chandra Biswas 29, Assistant-Surgeons Sasanka Mohan Mukerji, Sushil Chandra Bhattacharyya, and Rajani Kanta Datta 20, each. By Hospital Assistant Kali Kamal Kar were performed 20, by Hospital Assistant Mahim Chandra Chatterji 19, by Hospital Assistants Radha Krishna Nandi, Purna Chandra De, Kailash Chandra Pal, and Mrs. Pramada Datta, 15 each. Five other Hospital Assistants did more than 10.

BENGAL CIVIL VETERINARY DEPARTMENT REPORT, 1903-1904.

This department alone of all others suffers from a dearth of candidates, only 48 students presented themselves, with after withdrawals and removals only 21 remained in the Veterinary College. It is much to be regretted that the good work of this department is so seriously handicapped, as the veterinary dispensaries established in many towns have proved most useful.

Glanders is common in Calcutta, but only a mere fraction of the cases are sent for treatment, the Mallein test is used in all suspected cases. It is interesting to those who send their horses by rail to know that 175 horse boxes and 35 trucks were inspected, and disinfected during the year.

Cattle disease was reported from all Bengal districts except seven, and doubtless it existed unreported in these. Fifteen Veterinary Assistants were trained at the Imperial Laboratory at Bareilly in methods of antirinderpest inoculation; owing to want of assistants only 9,454 cattle were thus protected, and that too without any friction or misunderstanding with the owner, which is most satisfactory. We are glad to learn from another source, that the Civil Veterinary department have begun to make inquiries by the tuberculin test as to the extent to which tuberculosis is prevalent in Indian Cattle.

VACCINATION REPORT, PUNJAB.

It is satisfactory in view of the prevalence of Plague in the Punjab to read of an increase of some 17,000 vaccinations done in the year 1903. The average number of Vaccinators employed was 260. The average cost of each successful operation was 2 annas four pies, a satisfactory decrease compared with last year. The results recorded show that the percentage of success during the year worked out at no less than 99·23 per cent. and for revaccinations 76., both high figures. Captain W. F. Harvey, I.M.S., was Deputy Sanitary Commissioner during the year, and in addition to much plague work carried out many experiments on the preservation of vaccine lymph, and "has established the value of chloroform in destroying the bacteria which gain access to vaccine lymph, and some of which are liable to cause inflammation, without, however, destroying the virus of vaccine lymph."

ASSAM VACCINATION REPORT.

Of thirteen districts in Assam, there was a decrease in the number of vaccinations in seven and an increase in five, but the total number has considerably fallen off, and no satisfactory explanation of the fact is forthcoming. The percentage of success is given as 97·9, and for revaccinations 77·8. The proportion protected per 1,000 of the population is 44·2; the cost of each successful vaccination works out at one anna nine pies.

In the towns where the Act is in force, it appears that 67·7 per cent. of children available were protected, and this varies from 87 per cent. in Golaghat to 39 per cent. in Gauhati.

The Vaccine Depot at Shillong was in charge of Major E. R. W. Carroll, I.M.S. In all 520 calves were inocculated, but lymph was only taken from 444 cases. Each calf on the average gave enough lymph to load 966 tubes, the cost works out at 5 pies per loaded tube.

Current Literature.

MEDICINE.

I.

Normal Saline Solution.—When read in connection with the papers reviewed last month illustrating the therapeutic uses of normal saline solution, the following are of interest:—

In the *Therapeutic Gazette* of March 15th, 1904, Dr. G. A. Shank advocates venesection in those cases of lobar pneumonia, in which "the patient is being overcome by the toxin, as shown by the rapid and weak state of the heart, the rapid shallow respiration, the anxious face and the cyanosis," At the same time an equal or greater quantity of normal saline is introduced subcutaneously, the whole process resulting in the elimination of part of the toxin and the dilution of what remains. "This," he says, "will save a few pneumonic cases which otherwise will end fatally."

Professor Renault of Lyons in a paper before the Academie de Medicine, Paris, and reported in the *Medical Press* of March 2nd, 1904, described cases of renal incompetence and oliguria in which, after the failure of other remedies to produce free diureses, this was brought about by the administration of two pork kidneys macerated in 12 ounces of normal saline solution. At the same time the albumen diminished or disappeared from the urine, visceral congestion and œdema disappeared, as did also dyspnœa and cyanosis. The *modus operandi* is as follows :—"Take one, more frequently two, absolutely fresh pork kidneys, chop them up fine, and then wash them thoroughly in water so as to remove any stagnant urine they might contain. The chopped meat is then pounded up in a mortar with about twelve ounces of salt water (half a teaspoonful of salt), and the whole left to macerate for four hours, and then decanted. The patient will take it in three or four doses in the day. In order to make it more palatable, or rather less repugnant to the patient, I generally have added to it a little warm soup (soup julienne.) The administration of the macerated kidney should not exceed ten consecutive days, after which a rest of five days should be ordered, and the treatment recommenced." The only inconvenience observed was in some cases a slight pruritus, urticaria or sweating. In commenting on this paper one may venture to say that the effects described certainly seem to be far greater than could be expected from the mere use of 12 ounces of normal saline.

The treatment of desperate cases.—Under the above heading there is in the *Charlotte Medical Journal* for February 1904, an excellent paper by Dr. Southgate Leigh. The indications for hypodermic stimulation could not be more happily put. He says "This method of administering powerful strengthening remedies should be resorted to, not only when the stomach is unable to retain them, but also when there is doubt as to the absorptive power of the stomach, and in those extreme cases which demand immediate effect from the drugs." He lays great stress on the value of using a number of heart stimulants rather than in giving a large amount of one only, and advises as follows :—

Strychnine sulphate, gr. $\frac{1}{30}$ every three or four hours ; Caffeine and sodium benzoate, grs 3 every three or four hours. These are given alternately so that one would come every one and a half or two hours. In addition to these he uses Sparteine sulphate gr. $\frac{1}{2}$ every three hours if needed ; and also, if the pulse is over 115, digitaline gr. $\frac{1}{100}$ every three or four hours ; in the place of the last tincture of digitalis may be used although it is rather irritating for constant use.

Passing to absorption by the rectum, and having touched on the importance of high rectal injections of normal saline, especially after hæmorrhage, either with or without the addition of whisky, he considers rectal feeding. He emphasises the necessity for keeping the rectum clean by a daily cleansing with enemas of plain warm water. The feeds he recommends are :

Whisky ʒ ss to i. Peptonised milk ʒ iv to vi.	every eight hours.
Whisky ʒ ss to j. White of one egg. Panopeptone or liq. peptonoids ʒ ij. Normal salt solution, ʒ ij. to iv. These are given alternately	every 8 hours.

When more fluid is required the amount of normal saline solution is increased once or twice in 24 hours to a pint and given with the long rectal tube.

He has found saline hypodermic infusions most useful in hæmorrhage, puerperal eclampsia, and during operations. He dwells on the impossibility of saying who must die and who will live as a powerful stimulus to the use of these remedies in all serious cases.

C. L.

II.

OBSTETRICS AND GYNÆCOLOGY.

Mechanical Dilatation of the Cervix during Pregnancy and Labor.—De Seigneux (Archiv fur Gynakologie, 1903. Band LXX, Heft 3) criticizes Bossi's dilator because it has no pelvic curve, cannot be taken apart for cleansing, and cannot readily be shifted to vary the line of application of its force during its use. To correct these faults, he has invented an instrument resembling Bossi's in its general principles, having a pelvic curve and which can be taken apart for cleansing and whose branches are so placed upon the joints that they exercise force in various directions. He reports seven cases, in which his instrument was used by himself and others with satisfaction.

Causes of Sterility.—In a discussion of this subject before the Dutch Gynæcological Society (Zentralblatt fur Gynakologie, 1904, No. 3) Kauwer stated in 700 private cases sterility was noted in 101, 11 being that due to impotence in the husband. The speaker had been successful in treating less than one-half of the cases, in which this was the main symptom for which relief was sought (24).

Treub had noted 39 cases out of 188 in which the husband was at fault. In 80 cases occurring in married women where the semen was examined, he found azoospermia in 25 and oligazoospermia in 12. The speaker said that he always examined the husband's semen if possible.

Lysol Poisoning.—Hommer (Munchener med. Wochenschrift, 1903, No. 21) reports several cases in which intrauterine injections of lysol solution were followed by unpleasant results. From experiments on animals, he concluded that the use of strong solutions was not advisable In a puerperal case fatal thrombosis occurred from the entrance of lysol into a vein (the strength of the solution was not stated).

Comparison of Vaginal and Abdominal Hysterectomy for Cancer.—Oishausen (Zeitschrift fur Geb. u. Gyn., Band I, Heft 1,) reports 206 vaginal hysterectomies for cancer with 15 deaths, and 4 abdominal with 1 death during the years 1901 and 1902 He prefers the vaginal route until statistics extending over five years shall prove that the results of the abdominal method are better. The fact that Werthsem hopes that from 15 per cent to 18 per cent. of his cases will be permanently cured by the radical operation does not convince the writer, as his own cures have been 18 per cent.

Premature Menopause.—Sireday (Comptesrend. de la Soc. d'obstetrique de gyn. et de paed, December 1903) reports 5 cases in women whose ages ranged from twenty-two to thirty-five years. Three were in good health ; in one menstruation ceased after typhoid fever, though no direct casual relation could be established. One patient subsequently developed diabetes, from which she died. In all menstruation had previously been somewhat scanty, and three had been sterile. Climacteric disturbances were slight. The usual anatomical changes, especially atropy of the cervix, were well marked Treatment in true cases of premature menopause is useless.

Fibroids and Sterility.—Austerlitz (Prager Med. Wochenschrift, Nos. 23 and 24, 1903), among 339 cases of uterine fibroid found primary sterility in 20·23 per cent. and secondary in 21·25 per cent., as compared with 4·17 per cent. and 13·68 per cent, in women without such neoplasms. The writer was unable to demonstrate whether sterility was directly due to fibroids or not ; 51·2 per cent. of women with interstitial tumors were primarily sterile ; 22·2 per cent of the mixed variety ; 16·9 per cent. subserous, and 12·7 per cent. submucous.

J. W. F. R.

Correspondence.

THE SUCCESSFUL USE OF SOLUTION ADRENALIN CHLORIDE IN A CASE OF PLAGUE AND IN SEVERAL CASES OF ASTHMA.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—The following few lines I am prompted to write by my belief that every additional testimony to the value of a new drug is calculated to induce other medical men to try it, with eventual benefit to suffering humanity, however obscure the member of our profession may be, from whom the testimony may come.

My first acquaintance with the value of the suprarenal capsule as a medicinal agent took place within two months of my starting practice in Bombay. Four five-grain tablets of the capsule dissolved in a pint of hot water and introduced into the rectum by means of a long piece of rubber tubing, and an irrigator promptly checked hæmorrhage from the bowel of a patient suffering from leucocythæmia, when bismuth-subgallate and hazeline locally, and digitalis and ergot internally had previously failed. To say that the suprarenal capsule tablets saved the life of this patient is to state the bare truth. Subsequently the same agent continuously administered for a fortnight proved an effective preventive against hæmorrhage, which up to its administration had been of troublesome recurrence.

Recently my attention was drawn to the published report of Dr. K. C. Bose on the successful use of another preparation of this valuable organ, the solution adrenalin chloride (P. D. & Co.). Encouraged by the knowledge that it had proved so successful in the hands of Dr. Bose, I tried this preparation in a case of plague recently with astonishing results. A lady (21) came under my care on the second day of fever with tenderness in the right axilla. On examination, infiltration could be felt along the course of the axillary vessels, which developed on the next day into a small bubo. The diagnosis of plague was confirmed by Dr. Nariman of the Parsee Fever Hospital (Special Plague Hospital), and we agreed to put the patient on adrenalin at once. The pulse, which was 132 to 140 and soft and irregular, fell after the third dose of solution adrenalin chloride (20 minims for the first dose and 10 minims subsequently every two hours) to 98, became firm and regular both in rhythm and volume. The temperature which kept between 103 and 103·5 the first day was reduced to 102 and 102·8 by 5-grain doses of euriacol carbonate three hourly at first and subsequently half doses till 100° was touched on the fifth day of the disease, when the euriacol was discontinued. The case made an uninterrupted recovery, the temperature touching the normal line on the eighth day. The solution adrenalin was continued in 5 minim doses two hourly until the pulse fell to 82, then 3 minim doses were given four times a day until the twelfth day.

The point of interest is the rapidity with which the solution adrenalin chloride acted on the circulatory apparatus and the consistency and persistence of its action. The preliminary vomiting and diarrhœa of the first two days had ceased of their own accord, while the bubo subsided on the tenth day altogether. Glycerine and belladonna in equal parts were applied to the bubo, and poultices every two hours.

In adrenalin we have then a cardiac stimulant and tonic of the best and non-irritant kind, displacing the nauseous and nausea-producing digitalis, and is well worth trying. I need hardly mention that no other cardiac stimulant was administered, not even alcohol in any shape.

I have found adrenalin in 5 minim doses thrice daily for periods ranging from one to three months an excellent agent for the relief of asthma and diminution of the frequency of asthmatic attacks.

In a case of recurrent intraocular hæmorrhage one drop of 1 in 4,000 solution adrenalin chloride thrice daily effectually checked the hæmorrhage for good.

Convinced of the inestimable boon this new agent is to sufferers and doctors, I can't refrain from recommending those who have not yet tried it, to try adrenalin chloride solution in the first suitable case that offers itself.

Yours faithfully,

J. N. BAHADURJI,
M.R.C.S. (ENG.), L.R.C.P. (LOND.),
Late House Physician to the Brompton Hospital for Consumption and Diseases of the Chest.

AN HERMAPHRODITE.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I have got an hermaphrodite in the jail, at Karui, admitted as male under trial-prisoner. As these cases are comparatively rare, I send the description in order that you may publish it in your valuable paper.

Name ... ... Diba.
Age ... ... 17 years.
Caste ... ... Gond.
Place of residence ... Village Kooraila in Chatarpore State.

Appearance.—Womanish, moustaches present, mammary glands fairly developed.

Penis—Is about 1″ long, resembles male penis in every respect except that it is not perforated by urethra, but there is a little indentation at the seat of the passage. The prepuce does not cover the glans and appears as if circumcison had been performed. The prisoner says that when erect it becomes about 1½″ long, but he has got no desire for intercourse with either sex.

Labia majora and minora both present. Opening the lips of labia minora the *vestibule* is very small. On asking the prisoner to make urine it was found to dribble from a hole at the back part of the vestibule at a distance of 1½″ below the penis. On passing the female catheter it did not pass into the bladder, but in a *vagina*-like canal, which is about 3″ long, ending blindly. The forefinger could be introduced with some difficulty. No uterus could be felt either by bimamal or rectal touch. Then I suspected the passage of *urethra* in the anterior wall of this canal, and fortunately could pass catheter into the bladder through that opening which is about ½″ inside from the external opening.

There is a swelling like an *undescended testicle* at the left external abdominal ring, equal to the size of an almond. It is tender to pressure and can be made to descend into left labia majora. The prisoner gives no history either of seminal emission or menstruation. His parents are still alive, and the prisoner gives no history of any maldevelopment in parents.

Yours, &c.,
30*th September*, 1904. SAROOP NARAIN,
Asst.-Surgeon, Karui.

[Major F. O'Kinealy, I.M.S., recently showed us a good example of an hermaphrodite in his hospital at Midnapore. —ED., *I. M. G.*]

THE ROMOWNOSKY STAIN.

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—I was using the Romownosky's stain, as directed in Dr. Christopher's Book on "The Study of Malaria," for staining for malarial parasites, Leishman-Donovan bodies, for leucocyte counts, &c. I found a modification of same suggested by Dr. MacConkey in Thomson-Yates and Johnston Laboratories Reports, Vol. V, Part 2, which I gave a fair trial, comparing the results with the Romownosky's stain. I found that many advantages were gained by the modified stain.

1. Short time required for staining, which is a great thing for diagnostic purposes.
2. Results more constant.
3. Minute structures of the parasites, specially the chromatin are well brought out.
4. Pigments clearly defined. The technique of staining is as follows:—

The films on the slides are fixed with equal parts of absolute alcohol and ether (time required for this is 1 to 2 minutes). Then stained by the following stain:—

Stock Solution A.

Medicinal Methylene blue (Grübler)	...	0·5 grm.
Saturated solution of Sodii Biboras. (chemically pure) in distilled water	...	50·00 c.c.
Keep in the incubator for 4 days at	..	37° c.
Then add absolute alcohol	...	50·00 c.c.

Allow to stand for one day before use.

Stock Solution B.

Eosin Extra B. A., Grübler	...	0·25 grm.
Distilled water	...	50·00 c.c.
Absolute alcohol	...	50·00 c.c.

Now the working solutions are made by diluting one part of the stock solutions A and B with 19 parts of distilled water. The working solutions are to be kept in separate bottles.

Place the slides in a developing dish, the film side upwards. Take equal quantities of the working solutions in two c.c. measures. Pour over the slides mixing both as you pour. Keep rocking for a few seconds until both the stains nav thoroughly mixed.

Staining is complete in 3 to 6 minutes. Wash the specimens quickly in distilled water and dry in air, mount, examine with oil immersion.

Remarks.—From the above, it will be seen that the whole process of staining is complete within 10 minutes, whereas the Romownowsky's stain requires nearly 30 minutes, besides the other advantages enumerated above.

I therefore desire to give publicity to this in your valued Journal.

Yours faithfully,
10*th October*, 1904. P. S. RAMACHANDRER,
Laboratory Assistant.

WHICH SURGICAL PROCEDURE IN LIVER ABSCESS GIVES MOST CHANCE TO THE PATIENT?

To the Editor of "THE INDIAN MEDICAL GAZETTE."

SIR,—The question in this affection means so much. Is it possible to collect sufficient data here in India to come to an answer acceptable to the majority of the profession?

The three procedures are :—

(i) Tapping; (ii) Incision and drainage in one operation; (iii) Incision and drainage in two stages.

Let tapping be passed over, and also those rare cases when the abscess has made its adherence to the abdominal wall almost unmistakeable through the visible signs of a superficial abscess. In those cases we cease to deal with an ordinary *liver* abscess.

The question thus lies between (ii) and (iii). But there is an additional point entering as a factor in the problem, namely, the site of the abscess and thus the site of operation.

Generally speaking, liver abscesses divide themselves into two classes; (i) those which call for incision in front, in the epigastric region clear of the ribs and cartilages; and (ii) those to be approached through the ribs from the right side.

The problem then is a double one, namely, which operation gives the best chance (*a*) in front, and (*b*) at the right side.

Surgeons experienced in operations for liver abscesses have, so far as the limited enquiries of the writer indicate, found a bigger percentage of recoveries when the abscess called for operation on the right side. This is worth enquiring into.

While the fatalities with both types are great, the following reasons seem to have an adverse influence on operations in front, and especially in the operation which is finished at one sitting:

(i) The weight of the liver acting on the sutures.

The operations at one sitting includes the suturing of the liver to the abdomlnal parietes with the view of preventing leakage into the peritoneum.

The weight will tend to draw back the liver from the wound thus producing a minute opening between the liver and the abdominal wall.

(ii) This will be aided by the *upward* and backward retraction of the organ as the pus empties itself.

If the liver be large, the upward movement may be not inconsiderable.

(iii) The friability of the liver tissue. Here the nearer the pus is to the surface the more likely is the suture apt to tear somewhat through the liver tissue and produce a space for leakage, and thus what may seem to make the operation more satisfactory to the surgeon creates a graver risk to the patient.

If these three factors be appreciated at their right value, it would seem that wherever there was a possibility of choice, the operation in front should be conducted in two stages. The glueing of the liver will take place between the first and second, and with the liver moored accurately to the outer parietes, this terrible risk would be avoided.

It is quite possible that if the cases occurring in India were tested in respect to the pros. and cons. of the two operations we would have a valuable addition to our surgical procedure. We should be glad to see careful statistics made and published. To say that the patient sank after operation tells very little accurately, and may conceal from the surgeon the main factor in the untoward result. Some recover, some do not; constitutions, etc., do not surely account for all the differences; it is not always those with the best histories who recover, and if we can attain more exactitude in stating the results, there is no reason why this should not be sought.

It need hardly be added that our remarks refer to the solitary or single abscess.

W. HUNTLY, M.D., B.SC., M.A.,
Agra.

Service Notes.

AS a result of the knowledge acquired in recent wars, remarks Dr. C. I. de Alarcon (*Revista de sanidad Militar*), the wounds produced by bullets of small calibre may be considered as practically aseptic, and in harmony with the establishment of the principle that asepsis is preferable to antisepsis in the treatment of clean wounds. Spain has adopted a first-aid packet which is sterile or aseptic, rather than antiseptic, and in this lead she is followed by Holland.

THE new packet as described in official orders consists of the following:

1st. An outer envelope of impermeable fabric, 12 cm. long and 8 cm. wide, upon which are printed directions. The ends of the packet are rounded. The material is sewn on three sides, and the stitching is covered with two coats of rubber varnish.

2nd. An inside envelope of parchment paper.

3rd. Two safety pins, 6 cm. long, wrapped in a bit of waxed paper.

4th. Two compresses, each 10 cm. in length by 7 cm. in width and composed of a piece of absorbent cotton, 5 gm. in weight, between two layers of hydrophilous gauze.

5th. A cotton triangular bandage.

The packets are stored in zinc-lined pine boxes, dovetailed, 42 cm. in width by 55 cm. in length, the covers of which are fastened by screws. Each box holds 500 packets (*Journal Military Surgeons, U. S. A.*)

THE following note on some unprecedented medical aspects of the war now in progress we clip from the *J. Amer. Med. Association.*

"Warfare has lost its personal character, and is now merely wholesale butchery. This fact is impressively demonstrated by a letter from Dr. Paul Jacoby (*Progres Medical*, xxx, No. 33, Aug. 13,1904) of Orel, Russia, whose experience at the seat of war has shown that the battles and mine explosions affect men like great cosmic phenomena, in which the personal element is entirely lacking. Danger, death itself, present themselves under new and strange forms, altogether different from the ideas of war to which we have been accustomed since the days when knighthood was in flower. Our psychology has not adapted itself yet to the new aspect of warfare. A cruiser which in less than two minutes sinks with 800 men on board; a skirmish in which 104 out of 107 of the horses are killed; and assault in which every assailant drops to the very last man; an assault over a surface known to be undermined by fifteen hundred mines; these things affect one like a tremendous earthquake or volcanic eruption. Every physician knows that catastrophes of this kind breed psychoses, and the nervous condition of those who escaped from such catastrophes as the blowing up of the *Variag*, the *Petropavlovsk* and the *Hatsuse*, is similar to that of the survivors of some great cosmic upheaval. Nervous disturbances and psycho-physical troubles should be treated at once, and on the spot, in conditions of absolute repose. Some of the survivors of the battles and explosions at the seat of war were hurried away from the spot and sent home, the interminable railroad journey rendering their curable psychosis probably incurable insanity. Jacoby has urged on the Russian Red Cross, and his suggestions have recently been put in practice, that certain barracks and tents should be set apart for such patients, to isolate them and render possible the restoration of their nervous balance. The conditions of warfare all predispose to psychoses, under the most favourable surroundings, and the new forms of death—forms to which the mind is not accustomed—and the psychologic conditions which they create, must certainly have an influence on the psychophysical condition and on the pathogenesis of nervous morbidity among troops in active warfare. They may, perhaps, originate new morbid forms akin to the traumatic and hysteric neuroses of industrial origin. In the campaign in Manchuria all these causes are co operating with an unprecedented intensity, and the physicians at the seat of war have been so preoccupied with their surgical duties that these victims of the war have been neglected or sent home, thirty or forty days of railroad travelling being superadded to the other factors of their psychosis. Jacoby refers the brutal acts and perversions of men in camp life to unrecognized psychoses generated by their environment. The authorities and public opinion, however, are not always able to distinguish between a psychosis and a crime. He refers to the recent suicide of General MacDonald as an instance in point. The two armies now fighting in Manchuria have the sad privilege of inaugurating these new psychologic and psychopathic conditions of modern warfare with its character of industrial butchery by perfected processes."

LIEUTENANT C. A. GILL, I.M.S., took charge of the Civil Medical duties of the Tochi Valley on 4th September.

THE service of Lieutenant J. W. McCoy, I.M.S., are placed temporarily at the disposal of the Government of the Central Provinces.

CAPTAIN J. FISHER, D.S.O., I.M.S., is granted one year's combined leave from 16th September 1904.

CAPTAIN J. W. WATSON, I.M.S., medical officer, H. B. M.'s Consulate, Turbat-i-Haidari, is appointed to act, in addition, as Agency Surgeon, Meshed.

CAPTAIN P. P. KILKELLY, I.M.S., Agency Surgeon at Bikanir, took over, in addition, the duties of Political Agent, till further orders, on 19th September 1904.

THE leave of Lieutenant-Colonel F. C. Reeves, I.M.S., Surgeon, first district, Madras, will not expire till 8th June 1905.

LIEUTENANT-COLONEL J. C. MARSDEN, I.M.S., is not due to return to South Arcot till 3rd October 1905.

MAJOR F. C. PEREIRA, I.M.S., is due back on 6th January 1905.

CAPTAIN P. C. GABBET, I.M.S., was appointed to be District Medical Officer, Coconada, from 1st October 1904.

CAPTAIN H. ST. J. FRASER, I.M.S., Acting District Medical Officer, at Ganjam, is appointed to Guntur, but will continue to act at Ganjam.

THE leave of Captain J. W. Cornwall, I.M.S., will not expire till 30th October 1905.

CAPTAIN C. G. WEBSTER, I.M.S., will return to duty on 22nd June 1905.

THE leave of Captain E. M. Illington, I.M.S., will not end till 9th July 1905.

LIEUTENANT T. W. HARLEY, I.M.S., is appointed, from 1st October 1904, to act as Deputy Sanitary Commissioner and Inspector of Vaccination, Madras.

ON 1st October of the 59 men borne on the rolls of the Madras Civil Medical Department, 17 were absent on leave and 42 present in the cadre appointments.

MAJOR B. H. DEARE, I.M.S., Civil Surgeon of Rajshaye District, acted as Surgeon Superintendent of the Presidency General Hospital, Calcutta, during the absence on furlough of Major Pilgrim, I.M.S.

CAPTAIN J. J. URWIN, I.M.S., was appointed Civil Surgeon of Balasore on 11th September 1904.

THE following table indicates the numerical strength of the Marine Hospital Service of the United States :—

Surgeon-general	1
Assistant surgeons-general	6
Surgeons	31
Passed assistant-surgeons...	36
Assistant-surgeons	50
Chiefs of division of the hygienic laboratory ...	4
Sanitary inspectors	2
Acting assistant-surgeons	195
Medical inspectors	2
Internes	12
Pharmacists (first class, 16 ; second class, 25 ; third class, 9)	50

THE pay of commissioned officers of the Public Health and Marine-Hospital Service is the same as that of officers of similar grades in the Medical Corps of the Army, as indicated in the following table :—

Surgeon-general ...	$5,000	per annum
Assistant surgeons-general ...	2,900	,,
Surgeons	2,500	,,
Passed assistant surgeons ...	2,000	,,
Assistant-surgeons ...	1,600	,,

Officers are allowed furnished quarters, with fuel, light or in lieu thereof, commutations.

CAPTAIN W. E. McKechnie, I.M.S., is appointed to act as Civil Surgeon, Umballa.

THE following notification is issued regarding the Medical Officers authorized to conduct *post-mortem* examinations in the Punjab in supersession of all previous notifications on the subject :—

1. In exercise of the powers conferred by section 174 of the Criminal Procedure Code, the Lieutenant-Governor is pleased to appoint the Medical Officers hereinafter named to conduct *post-mortem* examinations under that section, and to rule that, except as provided in clauses 3 and 4, bodies for such examinations shall be forwarded to the authorized officer employed within the district where the case arises, to whom they can be brought by rail or otherwise in the shortest time.

2. The authorized officers appointed under this notification are :—

(1) All Civil Surgeons.
(2) All Medical Officers holding collateral Civil charges.
(3) In respect of deaths occurring within the limits of the Lahore, Montgomery and Mooltan Central Jails, the Superintendents of those Jails, being Medical Officers.
(4) All Staff Surgeons.
(5) All Assistant-Surgeons.

3. Bodies for *post-mortem* examination shall be forwarded to Staff Surgeons (*a*) when they are those of soldiers, camp followers or other persons entitled to the professional attendance of the Military Medical Staff ; and (*b*) when they do not come under clause (*a*), but the death occurs within the jurisdiction of the Court of the Cantonment Magistrate and there is no Civil Surgeon or Assistant-Surgeon residing in the cantonment or within three miles of it.

4. In the special cases named in this clause, bodies for *post-mortem* examination shall be forwarded when the death occurs within the limits of the jurisdiction of the Police Station :—

(1) of Anandpur, in the district of Hoshiarpur, between May 15th and September 15th of each year, to the Assistant Surgeon at Rupar, in the district of Ambala ;
(2) of Miani, in the district of Sialkot, to the Civil Surgeon of Lahore, throughout the year ;
(3) Tibi Kasrani, Dera Ghazi-Khan District, throughout the year, to the Assistant Surgeon of Leiah, Mianwali District.

CAPTAIN R. F. BAIRD, I.M.S., 1st Lancers, has passed the obligatory test in Punjabi.

DURING the absence of Lieutenant-Colonel, W. H. Quicke, F.R.C.S., I.M.S., Major Ashton Street, F.R.C.S., I.M.S., acts as Professor of Surgery, Bombay.

CAPTAIN T. S. NOVIS, I.M.S., acts as Professor of Anatomy, Bombay, *vice* Major Ashton Street.

CAPTAIN C. H. S. LINCOLN, M.R.C.S., acts as Professor of Materia Medica, Bombay (sub. *pro. tem.*)

LIEUTENANT-COLONEL QUICK'S leave is for seven months.

EXAMINATION—INDIAN MEDICAL SERVICE.—With reference to India Army Order No. 519, dated the 25th July 1904, it is notified that Army Regulations, India, Volume II, 1901 Edition, and Volume VI, 1898 Edition, will be used for the examination in October 1904.

WHEN the long looked for civil rates of pay come out it will be interesting to compare them with the following rates, now in force for medical officers, I.M.S., in military employ :—

The rate of pay drawn by Lieutenants of the Indian Medical Service previous to arrival in India is 14*s.* a day, but a Lieutenant (1) who has been permitted by the Secretary of State to hold a hospital appointment will receive no pay while holding it ; (2) who is detained by illness in this country will be paid at the rate of £200 a year from the date on which he would otherwise have embarked until the date of embarkation, and at the rate of 14*s.* a day during the voyage to India.

Pay at the above rate is issued in this country up to the date of embarkation, and an advance of two months' pay at the same rate is also made prior to embarkation, which is adjusted in India.

The following are the rates of Indian pay drawn by officers of the Indian Medical Service, *in military employ*, from the date of their arrival in India :—

Rank.	Unemployed pay.	Grade pay.	Staff pay.	In officiating medical charge of a regiment.	In permanent medical charge of a regiment.
	Rs.	Rs.	Rs.	Rs.	Rs.
Lieutenant	420	350	150	425	500
Captain	475	400	150	475	550
,, after 5 years' service	475	450	150	525	600
,, after 7 years' service	—	500	150	575	650
,, after 10 years' service	—	550	150	625	700
Major ...	—	650	150	725	800
,, after 15 years' service	—	750	150	825	900
Lieutenant-Colonel ...	—	900	350	1,075	1,250
,, ,, after 25 years' service.	—	900	400	1,100	1,300
,, ,, specially selected for increased pay.	—	1,000	400	1,200	1,400

NOTES.—(*a*) Unemployed pay is drawn by officers of less than seven years' service who are not holding officiating or

substantive charge of native regiments. Officers of more than seven years' service draw grade pay alone when unemployed. Staff pay is the pay of a command and is drawn in addition to grade pay.

(*b*) Horse allowance is granted to officers in substantive charge of cavalry regiments at the rate of Rs. 90 a month to Lieutenant-Colonels and Majors, and Rs. 60 a month to captains and Lieutenants.

Officers holding the principal administrative appointments and substantive military charges of the Indian Medical Service receive at present the following consolidated salaries :—

		Rs. per mensem.
Surgeon-General ...	...	3,000 to 2,200
Colonel	from ...	2,250
	to ...	1,800

Specialist pay at the rate of Rs. 60 a month is granted to officers below the rank of Lieutenant-Colonel who may be appointed to certain posts.

CAPTAIN C. H. S. LINCOLN, I.M.S., was granted one month's privilege leave from 24th August.

ON return from leave Major H. Herbert, F.R.C.S., has resumed his appointment of Professor of Ophthalmic Surgery, Bombay.

MAJOR T. E. DYSON, M.B., I.M.S., resumed his appointment as Deputy Sanitary Commissioner, C. R. District.

CAPTAIN S. H. BURNETT, M.B., I.M.S., was to act as Deputy Sanitary Commissioner, Western District, till further orders.

ON return to duty Lieutenant-Colonel R. W. S. Lyons, M.D., I.M.S., resumed his appointment as Civil Surgeon of Dharwar.

MAJOR B. B GRAYFOOT, M.D., I.M.S., resumed his appointment as medical officer, Kathiawar Political Agency.

CAPTAIN V. B BENNETT, I.M.S., was to act as Civil Surgeon of Bijapur, *vice* Major C. T. Hudson, gone on leave.

LIEUTENANT F. P. MACKIE, I.M.S., and Lieutenant J. McKenzie, A.A.M.E., have passed the lower standard in Urdu.

DR. J. L. HENDLEY has been granted two months extraordinary leave, without pay, on medical certificate.

MAJOR G. J. H. BELL, I.M.S., took charge of the Burma Lunatic Asylum, on 3rd October, relieving Captain F. A. L. Hammond, I.M.S.

ROYAL ARMY MEDICAL CORPS—SPECIALISTS.—The Commander-in-Chief in India is pleased to appoint as a tentative measure, with effect from 28th April 1904, the undermentioned officers of the Royal Army Medical Corps, as specialists in the subjects noted against their names :—

Punjab Command.

Captain K. M. Cameron, in advanced operative surgery.
Captain C. W. Profeit, in laryngology.

Bengal Command.

Captain J. Grech, in skiagraphy.

Bombay Command

Captain W. J. Taylor, in skiagraphy.

Madras Command.

Captain A. E. Milner, in skiagraphy. Up to the date he took over the duties of Officiating Staff Officer, Army Bearer Corps, Madras Division.

ROYAL ARMY MEDICAL CORPS.—Colonel J. F. Williamson, M.B., C.M.G., Royal Army Medical Corps, having been nominated by the Army Council, War Office, to be an administrative medical officer on the Indian establishment, is appointed Principal Medical Officer, Bombay and Nagpur Districts, relieving Colonel F. W. Trevor, M.B., Royal Army Medical Corps.

THE triennial award of this prize, consisting of seventy-five guineas and a bronze medal, has been made to Major R. Caldwell, R.A.M.C., for the best essay sent in upon "The Prevention of Disease amongst Armies engaged in Active Operations in the Field, with special reference to the sanitary organisation of a Field Force." The essays submitted by Majors E. O. Freeman and F. Smith, D.S.O., of the Royal Army Medical Corps, were highly commended by the assessors. The subject of the next prize is "On the Sanitary Requirements of Naval and Military Units in Peace and War ; with suggestions for complete schemes of sanitary organisation suitable for both the Navy and the Army." The competition is open to officers of the Naval Army and Indian Medical Services. Essays should be submitted to the Secretary of the Parkes' Memorial Fund, Royal Army Medical College, Examination Hall, Victoria Embankment, London, W. C., on or before December 31, 1906.

WE learn with regret that the army will shortly lose the services of Sir William Taylor, K.C.B., whose period of appointment as Director-General, A.M.S., terminates early in December, and are authorized to contradict the statement that Sir Frederick Treves is to succeed to the office. It is difficult to understand how such rumour obtained currency.—*B. M. J.*

THE school for the Royal Medical Services, which was started in Trinity College, Dublin, during the beginning of the year and has proved successful at recent R.A.M.C. and I. M. S. examinations, commenced its second session on November 7th.

The object of the school is to enable Irish medical students who desire to adopt the army or navy as a profession to prepare themselves in Ireland. The school, we are informed, has begun to attract candidates from Great Britain. It combines clinical work with lectures and practical work, and offers special facilities for operative surgery.

THE services of Surgeon-General W. R. Browne, I.M.S., M.D., are placed permanently at the disposal of the Madras Government.

CAPTAIN E. C. HEPPER, I.M.S., is posted as Civil Surgeon, Miranshah.

LIEUTENANT-COLONEL H. N. V. HARRINGTON, I.M.S., acts as A. M. S., in Central India, at Indore, *vice* Major J. R. Roberts, F.R.C.S., I.M.S., granted three months' privilege leave.

CAPTAIN H. J. R. TWIGG, M.B., I.M.S., has permanently joined the Bombay Jail Department.

WE are glad to hear that Captain Harold Meakin, I.M.S., has returned to India restored in health. He does not, however, intend to return to civil employ in Bengal.

CAPTAIN W. LAPSLEY, I.M.S., 10th Jats, has got one year's furlough. Pension service fifth year commenced 28th June 1904.

MAJOR W. L. PRICE, I.M.S., has been granted by the Secretary of State an extension of leave for six months on medical certificate.

MEDICAL EXAMINATION OF RECRUITS FOR TRANSPORT UNITS.—The medical examination of recruits for the Transport Service may be relaxed at discretion as regards visual tests, but medical officers must satisfy themselves that the recruits have good average eyesight and do not suffer from any disease of the eye likely to impair their efficiency as drivers. (I. A. Orders, 10th October 1904.)

CAPTAIN R. MCCARRISON, I.M.S., is posted as Agency Surgeon, Gilgit.

CAPTAIN J. W. F. RAIT, I.M.S., on leaving Chapra went to Motihari as Civil Surgeon, *vice* Lieutenant-Colonel Swaine, I.M.S., who retired on pension.

DR. V. L. WATTS, Civil Surgeon of Bankura, got six weeks' privilege leave from 20th October. Assistant-Surgeon K. N. Ghosh acts as Civil Surgeon of Bankura.

CAPTAIN A. GWYTHER, I.M.S., got ten days' extension of furlough, and on return was posted to Durbunga as Civil Surgeon.

THE services of Lieutenant-Colonel W. G. P. Alpin, M.D., I.M.S., are replaced at the disposal of the Military Department.

THE services of Major C. H. Bedford, M.D., I.M.S., who returned from furlough at the end of October are placed at the disposal of the Government of India in the Finance Department.

CAPTAIN F. D. BROWNE, M.B., I.M.S., joins the Jail Department of the Central Provinces.

ON return from furlough Lieutenant-Colonel D. Ffrench-Mullen, I.M.S., is posted as Chief Medical Officer in Rajputana.

LT.-COL. J. W. RODGERS, I.M.S., took over the duties of civil station of Kohat from Capt. L. J. M. Deas, I.M.S., on 16th September.

HONY. CAPT. W. G. MONTGOMERY, I. S. M. D., obtained 15 days' extension of privilege leave.

CAPT. C. H. S. LINCOLN, I.M.S., M.R.C.S., has obtained one week's extension of leave.

MAJOR W. S. P. RICKETTS is appointed Civil Surgeon of Broach, pending further orders.

LT.-COL. J. CRIMMIN, V.C., C.I.E., I.M.S., has been permitted to return to India, and has been granted an extension of leave for three weeks.

ON the return from privilege leave of Major Pilgrim, I.M.S., Major B. H. Deare, I.M.S., returns to Rajshaye District as Civil Surgeon.

CAPT. W. COPPINGER. I.M.S., who acted during the absence of Major Deare, is put on special plague duty in Bihar.

MAJOR D. M. MOIR, I.M.S., on being relieved of his appointment as Acting Professor of Anatomy in the Calcutta Medical College is posted to Chapra as Civil Surgeon.

LIEUT. A. E. WALKER, I.M.S., assumed charge of the civil medical duties of Mardan Subdivision on 2nd October, relieving Lieut. W. J. Collinson, I.M.S.

LIEUT. L. B. SCOTT, I.M.S., accompanied the Chitral Reliefs.

CAPT. S. H. BURNETT, M.B., I.M.S., is re-appointed as Civil Surgeon, Karwar, Bombay.

LIEUT.-COL. K. S. NARIMAN, I.M.S., is to act as Deputy Sanitary Commissioner, W. R. District.

CAPT. F. H. WATLING, I.M.S., is transferred as Civil Surgeon to Sambalpore, and Assistant-Surgeon N. Basak acts as Civil Surgeon of Bilaspur.

HONY.-LIEUT. M. WINDROSS, L.S.M.D., officiates as Civil Surgeon of Ellichipur, C. P.

ON return from leave Lieut.-Col. J. C. C. Smith, I.M.S., is posted to Meerut as Civil Surgeon.

MAJOR G. T. MOULD, I.M.S., was appointed to hold temporary charge of the Civil Surgeoncy of Jhansi, *vice* Major Halbert, I.M.S., transferred.

MAJOR J. K. CLOSE, I.M.S., is transferred as Civil Surgeon from Bareilly to Shahjahanpur.

MAJOR J. GARVIE, I.M.S., is transferred as Civil Surgeon from Meerut to Sitapur.

THERAPEUTIC NOTES.

"BOVRIL, THE DOCTOR'S ALLY."

THE virtues of Bovril are known throughout the whole world.

Its great value in aiding the system to resist disease, its power to restore impaired vitality, and to prevent or remedy the ill effects of hot climates, render it specially suitable to the needs of residents in India.

In all hot climates every needless tax on the digestive organs should be avoided. Bovril is composed of the nutritive and stimulating principles of beef, and the nutritive principles are so prepared, that they are easily assimilated by the most feeble. For that reason Bovril is a powerful agent in restoring lost health, and building up a strong constitution. The stimulating properties of beef, which Bovril contains, act as a tonic to the stomach, and assist the digestion of other foods. One of the objections to the use of alcohol is the reaction which follows its use. Bovril produces no reaction.

Most foods quickly lose their value in hot climates and become harmful. Bovril retains its valuable qualities unimpaired in any climate for years. This is not due to the addition of any preservative, but to the special method of its preparation. Scrupulous cleanliness is observed, and Bovril is not once touched by hand during the course of its manufacture.

The high and invariable standard of strength and quality is maintained by the close supervision of a staff of expert chemists, who work in laboratories in which are found the best modern appliances for testing and analysing Bovril in every stage of its preparation.

The medical profession appreciates the value of Bovril. It is in regular use in over 1,500 hospitals. Doctors recognise that Extracts of Meat and Beef Tea possess no nutritive value, but represent the stimulating properties only of beef.

MESSRS. BURROUGHS, WELLCOME & Co. announce that:—"The reponse to the announcement of the proposed Historical Medical Exhibition has been beyond my expectations, and this, together with the many valuable suggestions received from leading members of the profession and the trade, at home and abroad, has prompted me to considerably widen its scope. The extent of the work involved renders it impossible to fix a definite date for the exhibition until a later period, announcement of which will be duly made. Although in one sense, I regret this delay, it will on the other hand enable me to make the exhibit more comprehensive and complete, and to include many objects of exceptional interest that have been promised from different quarters of the globe."

INFORMATION has just been cabled that the Awards Committee of the St. Louis International Exposition has conferred one grand prize and one gold medal upon the Wellcome Physiological Research Laboratories for bacteriological research and preparations, and for educational work.

Notice.

SCIENTIFIC Articles and Notes of Interest to the Profession in India are solicited. Contributors of Original Articles will **receive 25 Reprints gratis**, if requested.

Communications on Editorial Matters, **Articles, Letters and Books for Review** should be addressed to THE EDITOR, *The Indian Medical Gazette*, c/o Messrs. Thacker, Spink & Co., Calcutta.

Communications for the Publishers relating to Subscriptions, Advertisements and Reprints should be addressed to THE PUBLISHERS, Messrs. Thacker, Spink & Co., Calcutta.

Annual Subscriptions to the Indian Medical Gazette, Rs.* 12, *including postage, in India. Rs.* 14, *including postage abroad.

BOOKS, REPORTS, &c., RECEIVED.

Madras Vaccination Report.
Vincent's Nutrition of Infant. (Balliere, Tindall and Cox.)
Lewis Jone's Medical Electricity. (H. K. Lewis.)
Thornton's Physiology. (Longmans.)
De Sante's Malignant Disease of Larynx. (Balliere, Tindall and Cox.)
Halliburton's Chemical Physiology. (Longmans.)
Mummery's After-teatment of operations. (B. T. and Cox.)
Lamb's How to Examine the Throat and Ear. (B. T. and Cox.)
Lake's Diseases of the Ear. (Balliere, Tindall and Cox.)
Report on Lathyrism.
Report on Rinderpest. Lingard's.

ACKNOWLEDGMENTS, COMMUNICATIONS RECEIVED FROM:—

Major E. Roberts, I.M.S., Simla; Major Maynard, I.M.S., Darjeeling; Major Chaytor White, I.M.S., Naini Tal; Lieut. B. Scott, I.M.S., Chitral; Mrs. Willes, Lucknow; Dr. Row, Madras; Rev. G. Crosier, Assam; Capt. E. Rost, I.M.S., Rangoon; Mr. E. Sandow, Calcutta; Major Austen Smith, I.M.S., Rai Bareilly; Lt.-Col. W. B. Bannerman, I.M.S., Bombay; Major Semple, I.M.S., Kassauli; Capt. Robertson-Milne, I.M.S., Purulia; Major Adie, I.M.S., Ferozepore; Major Fearnside, I.M.S., Vellore; Lieut. Christophers, I.M.S., Madras; Lt.-Col. W. G. King, I.M.S., Madras; Major Smith, I.M.S., Belgaum; Lt.-Col. Maitland, I.M.S., Madras; Major W. E. Jennings, I.M.S., Bombay; Major E. Jennings, I.M.S. Bareilly; Capt. D. McCay I.M.S., Calcutta; Capt. C. Lane, I.M.S., Calcutta; Capt. S. P. James, I.M.S., Simla.

Date.	
Month.	
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Calcutta; Capt. S. P. James, I.M.S., Simla.