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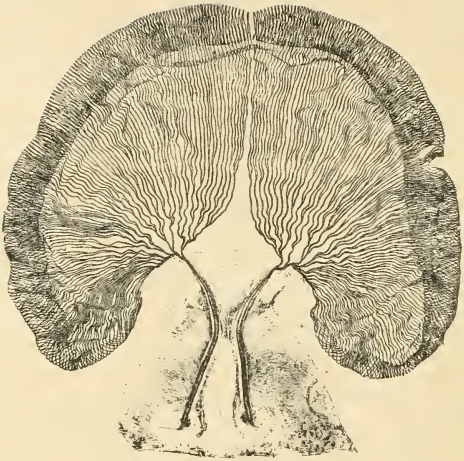


Photo by Oxycalcium light — Vincent Brooks, Pho[to-lith]

TONGUE OF CRICKET,

(ACHETA DOMESTICA) × 30 DIAM

THE

BRITISH AND FOREIGN

MEDICO-CHIRURGICAL REVIEW.

JULY, 1864.

PART FIRST.

Analytical and Critical Reviews.

Review I.

1. *On the Application of Photography to the Representation of Microscopic Objects.* By Joseph Delves, Esq. Read Oct. 27th, 1852. ('Trans. Mic. Soc.,' vol. i. p. 57, No. 3, Old Series.)

2. *On the Photographic Delineation of Microscopic Objects by Artificial Illumination.* By Geo. Shadbolt, Esq. April, 1853. ('Journ. Mic. Science,' vol. i. p. 165, No. 3, Old Series.)

3. *On the Practical Application of Photography to the Illustration of Works on Microscopy, Natural History, Anatomy, &c.* By Samuel Highley, junr. ('Journ. Mic. Science,' vol. i. p. 178, No. 3, Old Series.)

4. *Paper read before the Philosophical Society of Cambridge.* By the Rev. W. Kingsley. April 26th, 1853. ('Philosophical Magazine,' June, 1853.)

5. *Some Remarks on obtaining Photographs of Microscopic Objects, and on the Coincidence of Chemical and Visual Foci of the Object-glasses.* By F. H. Wenham. Read November 22nd, 1854. ('Trans. Mic. Society,' vol. iii. p. 1., No. 10, 1855.)

6. *Images Photographiques d'Objets vus au Microscope.* M. Bertsch. ('Comptes Rendus des Séances de l'Académie des Sciences,' tom. xlv. p. 213. 1857.)

Photographic Views of Microscopic Objects. By M. Bertsch.

7. *On the Photographic Delineation of Microscopic Objects.* Read before the Photographic Society, November 2nd, 1858. By J. Reeves Traer, Esq. ('Photographic News,' vol. i. p. 104.)

8. *On the Practical Application of Photography to the Microscope.* By Professor O. N. Rood. (Troy, New York, 'Trans. Mic. Society,' vol. ii. New Series, p. 261, No. 8, New Series, October, 1862.)

9. *On the Photographic Delineation of Microscopic Objects.* By. R. L. Maddox, M.D. Read November 12th, 1862. ('Trans. Mic. Society,' January, 1863, No. 9, New Series, p. 9.)

10. *On the Application of Photography to the Magic Lantern, educationally considered.* By Samuel Highley, F.C.S. ('Journ. Soc. Arts,' vol. xi. p. 141, 1863.)

11. *On the Photography of Magnified Objects by Polarized Light.* By Thomas Davis. ('Journ. Mic. Society,' July, 1863, No. 11, New Series, p. 200.)

The influence of photography, in its various applications, on our habits, our tastes, and social institutions, would prove a subject of the greatest interest, and has not as yet been treated with the attention it deserves. Certain it is that, having once possessed the art, we could ill afford to lose it. The wonder of yesterday has grown to be the social necessity of to-day; and so largely does it contribute to our luxuries and requirements, so intimately is it associated with our comfort, that it is difficult to convince ourselves that it is all the growth of some sixty years, that there are men still living who remember the first camera, and the mysterious powers with which their imagination invested it. Yet, recent as this growth has been, the origin of photography is apparently involved in as much mystery as that of any of the arts which derive from the earliest ages of civilization. Recent evidence[1] tends to prove that "sun-pictures" were taken by James Watt and his partner, Matthew Boulton, of Birmingham, as early as 1792; but if this be so, the power of producing them would appear to have been lost in the course of a few years, and to have had a new starting-point in the experiments of Wedgwood and Sir Humphry Davy on salts of silver in 1802. From this time forward, the art of "photogenic drawing" occupied a good deal of attention among scientific men in England and on the Continent. Many substances were found sensitive to light, and in France the bitumen of Judea was employed by M. Niepce, of Chalons, in a very interesting series of experiments which he instituted about the year 1814. By means of this substance, and with the various silver salts, pictures were obtained by the action of light; but the results were very imperfect, and it was not till the year 1837 that any real advance was made towards a practical application of the new discovery. In this year, the Rev. J. Reade, then living at Peckham, and pursuing some researches in photography, recalled a remark of Davy's, that pictures were more readily taken on leather than on paper. The

[1] The discovery of pictures, pronounced by some of the best judges to be undoubted photographs, and supposed to have been produced towards the close of the last century, has taken the photographic world by surprise. The evidence of their authenticity is being carefully collected by Mr. Smith, curator of the Patent Museum, South Kensington, and we may hope that the mystery which at present surrounds them may shortly be removed.

suggestion was immediately acted on by Mr. Reade, and he was rewarded by considerable success. The method adopted[1] was, to wash the paper with a solution of common salt, then with nitrate of silver; after which it was placed before the solar microscope to receive the picture, and washed over with an infusion of galls. As it was found necessary to keep the paper wet, Mr. Reade watched the picture during exposure, and though he had no idea at that time of an absolutely invisible image, strengthened the detail that was being produced by repeated washings with the infusion. When a certain tone of blackness, which he called "solar mezzotinto," was reached, the operation was suspended, and the picture fixed by hyposulphite of soda. This plan succeeded so well, that, by means of the solar microscope, pictures of entomological subjects, as well as sections of vegetables, with their cellular and vascular tissues, were produced, and the paper proved sufficiently sensitive to afford pictures by the light of an Argand lamp. Thus, even at this early stage, photography was applied to the delineation of microscopic objects, and it is in this connexion that it will be considered in the course of the remarks which follow. In the spring of 1839, Mr. Reade, independently[2] of Mr. Fox Talbot's discoveries in the same direction, had so far perfected his process as to be able to exhibit pictures at a *soirée* given by the Marquis of Northampton taken at one operation in less, sometimes much less, than five minutes, and varying in size from 50 to 150 diameters. A picture of a flea magnified 500 times, and one of his greenhouse with the gardener standing beside it, were amongst Mr. Reade's practical triumphs at this early date; and a bazaar at Leeds, in 1839, to which some of these pictures were sent, was the first occasion on which photomicrographs were offered for sale.

At the time that these experiments were going on in England, M. Daguerre and M. Niepce in France were occupied on those labours which resulted in the independent discovery by the former of the latent image, and the means of developing it, whilst by the substitution of a silver plate in place of paper, a greater degree of delicacy was obtained than was possible by any other method then in use.

In the year 1847, Daguerreotypes[3] of microscopic objects, taken with a solar camera, "very delicate and true," were exhibited by Dr. Carpenter at the meeting of the British Association at Oxford; and others were done about the same time by Mr. Richard Hodgson.

Much progress had been made thus far under considerable difficulties; and in the Exhibition of 1851 photographic pictures had attained to the dignity of being classed with philosophical instruments. To-

[1] Evidence *in re* Talbot *v.* Laroche, Journ. Phot. Soc., Dec. 18, 1854.

[2] Cf. Letter of Rev. J. Reade to H. Fox Talbot, Esq., quoted in Journ. Phot. Soc., July 21, 1854. We are very far from wishing to disparage the talent and energy which have enabled Mr. Fox Talbot to accomplish more for photography than perhaps any other single person, but in connexion with the rise of photomicrography as a special branch, Mr. Reade's name appears most prominently in contemporary notices—at the same time, photogenic pictures of microscopic objects were produced by Mr. Talbot before the discovery of his calotype process.

[3] Brit. Assoc. Reports, Oxford, 1847.

wards the close of this Exhibition year, however, a great advance was made through the discovery of collodion by M. Le Grey, in Paris, and Mr. Archer, in London, as well as by the substitution of pyrogallic acid for gallic acid as a developer.

All branches of photography felt the impetus of these discoveries, and in the autumn of 1852, though pictures had been previously taken and notices read before various societies by Mr. Hodgson, Mr. Reade, and many others, the first published account in detail that we have been able to meet with of the application of photography to the delineation of microscopic objects was read before the Microscopic Society of London by Joseph Delves, Esq.,[1] of Tunbridge Wells. This paper, illustrated by excellent specimens of the photographs themselves, appears in the Society's 'Transactions' for the following year, together with two others on the same subject by Mr. Shadbolt and Mr. Samuel Highley, which will require to be noticed more in detail hereafter. In the 'Philosophical Magazine' for the same year, we find recorded the Rev. W. T. Kingsley's experiences with artificial light, by which he succeeded in producing very beautiful results, and even pictures of opaque objects, as Foraminifera,[2] whilst a picture of Pleurosigma angulatum is described as having been taken by Mr. Wenham with an amplification of 15,000 diameters, still showing the markings perfectly black and distinct.

During the ten years that have elapsed since 1854 up to the present time, several labourers have at different times added their experiences, and more or less advanced the art of photomicrography. We may mention more especially M. Bertsch, who exhibited at the Academy of Sciences, in 1857, specimens of diatoms from guano, and human blood-globules, taken at an enlargement of 500 diameters in less than a second, with an instrument specially constructed for the purpose by M. Hartnach;[3] Mr. Reeves Traer, in 1858; and later Professor Rood, of Troy, who has given a full and most instructive account of his process, to which we shall have frequent occasion to allude in the course of this paper; but no one has devoted himself so thoroughly to the development of this branch of art as Dr. Maddox, of Southampton, from whose continuous labours we may expect the most important and practical results.[4]

It would seem at first sight an anomaly that so few persons have devoted themselves to a pursuit which promises so much as Photo-micrography; but when the time necessary for its successful prosecu-

[1] Mr. Highley speaks in the highest terms of a photograph of Pleurosigma angulatum taken by Mr. Delves, and says that even in 1863 it had not been surpassed. Journ. Soc. of Arts, vol. xi. p. 141.

[2] We have lately had the pleasure, through the kindness of Mr. Kingsley, of seeing some of these pictures; the proboscis of a blow-fly, head of larva of hydrophilus, a section of coniferous wood, and foraminifera, which, even at this distance of time, are in excellent preservation.

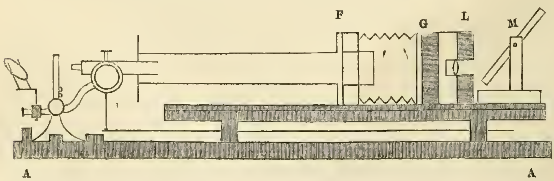
[3] Cosmos, vol. xi. p. 179, Aug. 14, 1857.

[4] Some exquisite pictures of acari, diatomaceæ, &c., for which we are indebted to the kindness of Dr. Maddox, fully bear out the expectations of the text; the photographs, in some instances, being all but fac-similes of the objects as seen through the microscope.

tion, the combined difficulties of microscopy and photographic manipulation, together with the expense necessarily attending the purchase of accurate instruments, are taken into consideration, it can scarcely be wondered that a fortunate combination of circumstances rather than deliberate choice should lead any one to make it his study. The number of those who pursue this branch of photography will doubtless increase as the various processes and manipulations become simplified; and it is only by the united experiences of many workers that difficulties can be dispersed. Many valuable hints are lost to science through diffidence or indifference on the part of those who have themselves done good work, or from the results of their labours being recorded in publications more or less difficult of access. This paper is written with a view of collecting as far as may be the "disjecta membra" of photomicrography, and arranging them in some practical form; and it is hoped that such a general view may be given, that many who are fortunate enough to have access to a camera and a microscope, or even to the latter alone, may be induced to practise an art which, whilst capable of affording a never-failing amusement for a leisure morning or long winter evening, will at the same time enable them to record, with a faithfulness and truth unattainable in any other way, many interesting appearances, pathological and physiological, which would otherwise be irretrievably lost. As the evening hours will probably be the only time which can be given up by men engaged in a busy and absorbing profession, and as our own experience has been gained chiefly whilst using artificial means of illumination, prominence will be given in the remarks which follow to the arrangements necessary for working by the light of a lamp. We shall now proceed to consider somewhat in detail the various instruments and processes required for the production of photographs from microscopic objects, such knowledge of manipulation, photographic and microscopic, being presumed in the reader as may be obtained in the ordinary treatises on those subjects; and with a view to the saving of all unnecessary expense, the simplest contrivance which has been found available will in each case be described. An ample field, however, will always be left in this direction for the exercise of the individual operator's ingenuity and skill in adapting his available resources to his own peculiar circumstances.

The Camera may be considered as the dark chamber extending from the object-glass of the microscope to the screen on which the objects are focussed. Provided all light be excluded save that required for the picture, the means used for the purpose are of minor importance. The following arrangement has been found to combine in a large degree the advantages of cheapness and simplicity of construction:—a stout well-seasoned board, six or seven feet long by fifteen inches wide, is selected as a basis of operations. This is well blackened on the upper surface and fitted with grooves (strips of wood will answer, fixed with screws), in which the supports of camera, microscope, and illuminating apparatus may slide evenly and with accuracy. The back part of an ordinary camera, containing the focussing glass, is then rigidly fixed to a light block adapted to slide in the grooves of the base board, and the microscope, placed horizontally, is secured to a similar block by moveable clamps, and mounted at such a level that its axis shall correspond with that of the camera; while two blackened slips of wood, diverging from one another and united by cross-pieces, so as to form a light triangular framework, resting with its base on the camera and its apex on the microscope, connect the two instruments above, and support a large piece of thick cotton velvet, which (pile-side inwards) is thrown over all. Lastly, to render all light-proof, the edges are well tucked in, and the junction of the cloth with the microscope effected by a layer of cotton wool wrapped closely round the tube of the instrument, to which the velvet is easily secured by a thread or india-rubber band. Every screw-head and reflecting portion of brass-work is then carefully coated with a dead-black varnish, and the camera is ready for any experiments where the illumination is effected by artificial means. The apparatus, so constructed, might be laid on a stout steady table; or, if for use in the open air, supported on a couple of tripod stands.

A construction so simple, however, although perfectly adapted for a feeble light, would scarcely answer for work in ordinary daylight or in a strong sun. The exclusion of light, in place of being a simple matter, then requires the utmost care and attention; and it will probably be found necessary to adopt the more expensive and elaborate arrangements described by Professor Rood, Mr. Highley, or Dr. Maddox. The body of Mr. Highley's camera is of wood, and rigid throughout, with a triple telescope chamber, giving a range of from 12 to 30 inches; it is also fitted with a most useful arrangement, by which the object-glasses may be employed alone where it is not found convenient to devote a microscope to the purpose. Another wooden camera, recently patented by Mr. Eden, labours under the fatal objection that there is no arrangement for materially shortening or lengthening the distance between the object-glass and the focussing screen. Dr. Maddox and Professor Rood have both adopted a modified form of the bellows camera, which, though somewhat expensive, combines the advantages of packing into a small compass, and ready adaptation to any length required. Professor Rood has given a full description of his instrument, a figure of which is annexed, with a view to rendering the description more readily intelligible.



Length of A A′ 7 feet. The frame, holding the ground glass, slides in at G; behind it, at L, is a door on hinges, carrying an achromatic lens of two-inch focal length, for the purpose of magnifying the image on the ground glass while focussing; at F is a rod connected with a flap of blackened sheet brass in the interior of the box, with which the exposure of the sensitive plate is conveniently effected. A plane mirror, mounted as seen at M, reflects the image of the ground glass, enabling the operator not only to arrange the illumination with nicety, but to select the microscopic object, and to focus it approximately.

The camera itself is composed of the body of the microscope attached to a pasteboard tube, which again is fitted into a bellows camera of the ordinary description. The addition of the shutter for short exposures in sunlight, and the framework for a focussing lens, though not essential, are doubtless of great convenience; and at all events answer the purpose of keeping the various parts of the apparatus together and ready for immediate use. But a regular camera is by no means necessary when a room can be devoted to photographic purposes. A simple hole in a closed shutter, as suggested by Mr. Wenham, through which the stage of the microscope can be exposed to the sunlight—a couple of holes, with sleeves attached, through which the mirror may be adjusted on the outside, and a screen at any required distance, with the dark room itself for a camera, will answer every purpose; and for this plan Mr. Wenham claims many advantages, which are not to be obtained by any other method. Living inside the camera, as it were, and having ready access to the focussing screen and the sensitive surface of the plate during exposure, the operator is enabled to ascertain accurately the portions of an object which do not fall in one plane, and can either bring them to a focus by an inclination of the screen, or cover up certain portions during the first exposure and take them at a subsequent operation, when the parts which the light has already acted upon have been screened off in their turn. The result is a picture of the object, which otherwise could only have been obtained on two or more separate plates.

Focussing Screen.—The texture of the ordinary ground glass screen answers well for the lower powers, but it is far too coarse for focussing the more delicate microscopic objects. Mr. Traer speaks very highly of glass etched with hydrofluoric acid for this purpose, but the most perfect surface is a plate coated with collodion, sensitized in the usual way, and protected by a solution of tannin, as in the preparation of plates for the dry processes.

The finest definition on diatomaceæ is clearly seen on a screen of this kind; indeed, the image, as viewed obliquely, will present very much the appearance of the finished positive on paper.

The Microscope.—The form of microscope is of minor importance provided the lenses be really good. A short wide tube, however, is, *cœteris paribus*, an advantage, as giving a larger field under certain circumstances. The instrument should be mounted, so that when levelled horizontally and accurately centred, a light thrown through the lens of the object glass may form a rounded disc in the centre of the focussing screen at all lengths of the camera. Should it be intended to work without an eyepiece, it will be advantageous in some cases, when the field is contracted, to remove the draw-tube and insert in its place a tube of black cotton velvet, to prevent any reflection from the polished brasswork. It is of the first importance to obtain thoroughly dark and unreflecting surfaces within the camera, or stray light will inevitably keep boxing about and mar the sharpness and brilliancy of the negative.

Stage movements.—The stage movements found attached to the higher-priced microscopes, though disparaged by Mr. Traer as expensive luxuries, are certainly of the greatest service, and much time is saved by their use both in finding the object and in placing it in position, even where the lowest powers are employed ; still, it is possible to do without them, and no one need be deterred by their absence from photographic experiments. When the higher powers are used, however, they become absolutely essential, as adjustments are required which tax the delicacy of the finest finger touch.

Sub-stage.—The advantages of a sub-stage carrier for condensers will also be appreciated by those who work with the higher powers and an artificial light, which requires the greatest concentration and most accurate adjustment in order to produce a picture.

Object-glass.—The lenses sold with the microscopes of the principal opticians may be made to fulfil all the conditions required, but much trouble and annoyance would undoubtedly be avoided by having glasses specially corrected for photographic work. In passing through a simple lens the component parts of light are refracted in various degrees ; the violet or actinic rays of the spectrum being brought to a focus at a point nearer to the lens than the yellow and red rays which form the ordinary and visible image. With a view to correcting this chromatic aberration, and at the same time to compensate for under-correction in the eyepieces of the microscope, the best object-glasses are invariably over-corrected, so that the actinic rays, instead of being brought to a focus at a point nearer to the object-glass than the red and yellow, are projected farther from it, and the invisible chemical image will lie in a plane more distant from the object than the image focussed on the screen. The object-glasses, therefore, which are most perfectly adapted for microscopic purposes possess least of the qualities aimed at in a photographic lens; and if they are to be used, some method must be adopted with a view to readjusting the chemical and visual foci. Various means for effecting this correction have been described, and they may be classed under two heads: 1. Those which aim at bringing the chemical and visual rays to a common focus by the addition of compensating lenses to the ordinary object-glass; 2. Those which provide for taking a picture in the plane of the actinic and invisible focus. Amongst the first is the plan mentioned by Mr. Wenham—he screws, in place of the back-stop of his object-glass, a bi-convex lens made from an ordinary spectacle lens, carefully centred and turned of the required size, and he finds that by adapting

A lens of 8 in. focus	to an	$1\frac{1}{2}$ in.	of Smith and	Beck;
" 5	"	$\frac{2}{3}$ in.	"	"
And the same	"	$\frac{4}{10}$th in.	"	"

the chemical rays are made to coincide precisely with the visual, and the glasses are perfect for photographic purposes, though totally unfitted, being non-achromatic, for microscopic use. Mr. Kingsley arrived at the same result by adapting new front lenses to his object-glasses. Mr. Traer[1] found the difference of the two foci so slight in the lenses he used, even in the higher powers, that his $1\frac{1}{2}$ inch was corrected by the addition at its back of a double camera lens of about 4 in. focal length. But it is not every one who can afford to devote an expensive lens to photographic purposes exclusively, and objections may be raised to the introduction of an additional glass, and consequent loss of light, when the means of illumination may be barely equal to the work they have to do. In spite, therefore, of the conveniences attaching to corrections by the means which have been described, many will prefer the simpler, if at first more troublesome, plan of ascertaining the exact position of the invisible image. The mode in which this is effected will be fully described under the head of *Correction.*

A good lens for photomicrographic purposes is still a desideratum; it should combine many qualities which are becoming less and less common in microscopic object-glasses; for while, in the latter, penetrating power is sacrificed for high angle of aperture and accurate definition in one plane, the photographic lens, besides being specially corrected for chromatic aberration, should possess the greatest amount of penetrating power with flatness of field. For special work, as for instance showing the finer lines on diatomaceæ and other test objects, a large angle of aperture and great resolving powers are doubtless essential; but for ordinary objects penetration must be aimed at, and it stands in a directly inverse ratio to the defining powers of an objective. As a rule in working, the lowest power compatible with clear definition and resolution should be preferred, and further enlargement, if required, may be effected by the ordinary camera: or a high eyepiece may be employed, but it will be at the expense of some loss of definition. Mr. Slack,[2] with a 3-in. objective and a high eyepiece made by Steinheil of Munich, found that he could take in a field $\frac{1}{20}$ in. diameter, with an enlargement of 150 diameters; his $2\frac{1}{2}$ in. with the second eyepiece took in the same field; he also found that crystals of arsenic and specimens of campylodiscus spiralis were well shown with a 3 in., combined with the higher eyepiece; care must, however, be taken not to force a lens beyond its capabilities by employing an objective of a power too low to bring out the finer details distinctly.

Other methods have been suggested for obtaining increased penetrating power, such as placing a pinhole stop in a cap fitting to the

[1] Photographic News, vol. i. p. 104.

[2] Intellectual Observer, Oct. 1863.

front of the object-glass. This is, of course, from the enormous loss of light, only applicable to operations in sunlight; but Mr. Dallas[1] asserts that with a Smith and Beck's $\frac{2}{3}$ in. and an aperture of $\frac{1}{50}$ in. diameter, perfect definition is obtained in every part of an object of depth enough to require a turn and a half of the fine adjustment screw of Smith and Beck's student's microscope to change the focus from the upper to the lower part, equivalent to a thickness slightly more than $\frac{1}{100}$ of an inch; or a stop may be placed on the posterior lens, as suggested by Mr. Howlett[2] of Kensington, the object being in all cases the same—viz., to reduce the angle of aperture as far as may be compatible with a satisfactory display of the object. But even with glasses most carefully prepared there will always be a great number of objects which it will be impossible to represent adequately in a single picture; the definite and complete idea conveyed to the mind by observing an object through the microscope whilst one part after another is brought into focus cannot be rendered with perfect fidelity, though an approach to it may in some instances be made by a composition picture, taken in the manner already mentioned, as recommended by Mr. Wenham.

Rough adjustment.—Whether the stage be the moveable part, as in Mr. Highley's and Mr. Traer's[3] instruments, or the body of the microscope as in ordinary cases, the same difficulty will be found in reaching the adjustment where the microscope is used without an eyepiece, and the camera is consequently of considerable length; to meet this Professor Rood made use of a rod (*vide* figure), attached to a lever working on the milled head of the rough adjustment; the most accurate focus may be obtained in this way, and all that is needful is a stout brass rod, bent so as to clip the milled head, and attached by a loop of wire and a cork to a wooden rod, of the length required to suit the camera in use. By the introduction of an eyepiece the length of camera will be reduced and the difficulties of focussing partially removed; but there are disadvantages attending this plan, such as loss of light and definition, with variation in the "correction," which will have to be carefully weighed against those arising from an inconvenient length of camera.

Fine Adjustment.—When the hand of the operator is enabled to reach the fine adjustment attached to most microscopes, it will be found of very great service in accurately focussing the finer objects; but it is of more especial value in effecting the corrections for the difference of visual and actinic foci, as will be described farther on. The greatest care should be taken, however, to ascertain if the screw acts promptly in both directions; for it frequently happens that the worm has become worn by use, and a considerable movement of the milled head produces no effect on the focus. The adjustment in such case is worse than useless, and many nights' work may be spoiled before the true cause of failure is discovered. When it is found to work evenly and surely, a small wire index fixed to the milled head of the fine adjustment, and pointing on a card dial placed behind it, will afford

[1] Journal Photogr. Soc., Aug. 22, 1853.
[2] Photographic Notes, vol. iii. No. 55, July, 1858.
[3] Journal Photogr. Soc., Jan. 21, 1859.

great facilities for observing and registering the minutest alterations—a matter of some moment where the corrections for visual and actinic foci in the higher powers have to be ascertained. In the case of a long camera, there will be some difficulty in using the fine adjustment for accurate focussing; but by adapting a fixed screw to work evenly into the end of the long focussing-rod attached to the rough adjustment, the greatest nicety may be obtained, even with the highest powers. The object is first focussed, employing the eyepiece as in the ordinary use of the instrument, and the screw inserted into the proximal end of the focussing-rod. The microscope is then carefully levelled and attached to the camera; lastly, the brass lever is applied to the milled head of the rough adjustment, and the screw of the focussing-rod worked backwards and forwards until the correct focus is ascertained. The fine adjustment is thus reserved exclusively for correcting the visual and actinic differences, and the whole process is under the control of a single hand—a very great advantage, even where assistance may be at all times available.

It appears, then, that the microscope with its stage, sub-stage, and mirror, is a most convenient arrangement for supporting the lenses and object. Substitutes for the more expensive instruments have been used by Mr. Traer,[1] and, as before mentioned, by Mr. Highley,[2] in whose arrangement the lens may be screwed directly into the camera; and it certainly would be no slight advantage to get rid of the tube of the microscope, which often limits the field, if this could be effected without sacrificing any of the stage conveniences which a well-made microscope affords. A combination, perhaps, of Mr. Highley's apparatus with that of Professor Rood, would give an instrument possessing many advantages over any hitherto in use, and, with the addition of a swing back and some contrivance for finer adjustment of the focus at a long camera, there would be little wanting to make the arrangement complete.

Source of Illumination.—The light used in photography may be obtained either directly from the sun or from some artificial source; and the light obtained from the combustion of different substances will be found to possess for each a definite chemical power, some being rich and others poor in the actinic rays of the spectrum; even the light of the sun itself is found to vary in this respect, according as it is direct or reflected from a white cloud or other body.

It is much to be regretted that more extended experiments have not been recorded on the chemical powers of light obtained from various sources, for a series of researches with this end in view could not fail to be of the greatest service. At present, the most contradictory accounts are published, but they might probably be reconciled by a consideration of the means employed for taking a picture, and by a careful comparison, as regards their sensitiveness, of the films used for receiving the impression. Mr. Wenham says:

[1] Journal Photogr. Soc., Jan. 21, 1859.
[2] Journal Micros. Soc., No. 4, O.S. vol. i. p. 305.

"I have not yet succeeded in producing a satisfactory result from either gas, oil, or camphine-lamps; burning phosphorus will give a more rapid impression, but its use is both inconvenient and expensive. Fine zinc turnings, burnt in the atmospheric air, equal or surpass this; a ball about $\frac{3}{4}$ in. diameter will last a sufficient time to give a distinct impression. As it is of no consequence whether the light is intermittent or not, I have produced an image from a succession of electric sparks, arising from the spontaneous discharge of a small Leyden jar, containing about thirty inches of coated surface, the discharging knobs being placed in the axis of the lenses for condensing the light upon the object. I found that about 100 discharges produced a good impression. . . . In a few instances I have used the 'hydro-oxygen' light or 'lime light;' but I consider that it does not possess that degree of actinic intensity which its brilliancy of appearance would seem to indicate."

Mr. Legg produced photographs at a 3-feet camera with a $\frac{2}{3}$ in. and $\frac{4}{10}$ in. in from four to ten minutes, by the light of a camphine lamp; and Mr. Shadbolt also speaks in favour of this source of illumination. Another experimenter, writing under the signature of "G. B.," in the 'Microscopic Journal,'[1] says that, using gas and an Argand burner, he got pictures with a $\frac{4}{10}$ in. and under in from five to fifteen minutes. Professor Kingsley's experiments were performed with the oxy-hydrogen light, and he obtained good results, even with opaque objects. Our own experience has been gained almost exclusively from the use of a common oil-lamp (solar burner) for the lower powers, and the oxycalcium light for the higher; and it has appeared certain that, when properly collected and condensed, the latter is possessed of actinic intensity sufficient for pictures of very considerable degrees of enlargement. Even the oil-lamp gave impressions of diatomaceæ, feeble, it is true, but still distinct, with a $\frac{1}{5}$-in., at an exposure of from twelve to fifteen minutes. It was found, however, advisable to confine its use to enlargements under 150 diameters.

The experiments of Professor Stokes[2] have a most important bearing on this subject, and may be briefly alluded to here. He found that candlelight and camphine gave spectra very deficient in chemical rays; ether was a little richer; spirit and naphtha gave a good percentage, and the flame of hydrogen was found to possess great chemical power; but by far the most powerful effect was produced by the electric discharge, and even this was found to vary with the substances composing the electrodes; for whilst the less refrangible rays of the spectrum remained nearly unaltered, the more refrangible differed to a considerable extent. The spectra of nickel and copper, for instance, were much prolonged at the violet end; indeed, with the latter Professor Stokes was enabled to render visible, by means of a highly fluorescent surface,[3] a spectrum no

[1] Quarterly Journal Micros. Soc., No. 7, 1854.

[2] Phil. Trans., 1852, p. 465.

[3] Certain substances, as uranium or canary glass, decoction of horse-chestnut bark, solution of quinine in 200 times its bulk of acidulated water, and decoction of madder, have the power of rendering visible the actinic rays of the spectrum intercepted by them, and have been named "fluorescent" by Prof. Stokes, who has made them the subject of some interesting experiments. Cf. also on the same subject a paper by Geo. Wilson, M.D., quoted in Journ. Photogr. Soc., June 22, 1857, "On the Production of Photographs on Fluorescent Surfaces."

less than six or eight times the length of the ordinary spectrum. But aluminium would seem to be the richest of all metals in rays of extreme refrangibility, when employed as an electrode in the manner described.[1]

Many compositions have been tried from time to time with varying success; but a cheap and effectual source of artificial light still remains to be discovered. In the meanwhile it behoves those who would work to make the best use of that which they can command. Where an oil-lamp is employed, great care should be paid to having the wick fresh and clean. The solar burner is perhaps the best form, and, with a good oil, a bright white flame is easily obtained. Where a lamp is used, it has been suggested that the addition of iodide of potassium or camphor might increase the actinism of the flame; but we have not as yet found any practical difference where they have been tried in some approximative experiments on the chemical powers of various kinds of light; their effect, however, may have been neutralized by the action of the lime-ball, which was always ignited at the same time; for Professor Miller found that rays of low refrangibility, proceeding from an oxyhydrogen flame, were changed by contact with solid lime into rays of a high degree of refrangibility. Other methods have been devised for increasing the power of light, amongst them that of Mr. Highley,[2] who proposes to alter the nature of the rays passing through such objects as are suitable for the experiment, by the employment of polarized light and a Darker's selenite stage. By this means he was enabled to bring crystals to a deep blue colour, whilst the ground was of a greenish tint.

The position of the light will vary with the means employed for collecting it. Should the rays be passed directly through a condensing lens on to the object, it will be found convenient to mount the lamp on the block with the microscope, so that its proper position, once found, may be subsequently ascertained without trouble. Another plan is, to place the lamp a little to one side, as nearly at the focal distance of the concave surface of the mirror as possible; the rays may then be thrown on the object either directly or after being transmitted through a condenser. Much light is lost by both these methods, for the rays from a lamp, being divergent, can only be partially collected; but in the latter plan we meet with an additional disadvantage in the loss of chemical intensity from absorption by the reflecting surface, as is proved by the experiments of Professor Miller,[3] where the length of the spectrum for light reflected from burnished lead and silver or mercury is in the proportion of 74 to 63, the great loss taking place in the more refrangible rays. With a view to applying as large a percentage as possible of the illuminating pencils, Mr. Kingsley has employed an elaborate system of collectors, having a very large angle of aperture, and consisting of a meniscus, with its concave side to the light, a plano-convex and a double convex lens, being a combination similar in effect

[1] Proceed. of Royal Soc., vol. xii.
[2] Journ. Soc. of Arts, 1853, following Prof. Kingsley's paper.
[3] Phil. Trans., 1863; quoted in Journ. Chem. Soc., Feb. 1864.

to Herschel's doublet. The diverging rays collected in this way and condensed, are rendered parallel by being passed through a small plano-convex lens placed between the collectors and condensers. By taking out the first two lenses of this combination, the arrangement may be used for sunlight operations.

Condensers.—When sunlight is used, the ordinary mirror attached to the microscope is sufficient for most purposes, the flat or concave surface being used according to circumstances; but a more powerful condenser will generally be requisite when artificial light is employed, and even in sunlight with the higher powers. An ordinary bull's eye of some 3-in. focus will be found convenient, either alone or in combination with the hemispherical drum invented by the Rev. J. Reade[1] —a most manageable form of condenser, by which the light may be readily centred and adjusted, whilst its system of stops which throw the rays in any required direction, affords the greatest facility for resolving the finer lines of diatomaceæ and other test-objects. It possesses, moreover, another advantage, of some importance where operations are carried on in sunlight; for the intense heat, so injurious to the lenses in some cases, may be entirely avoided by placing the lens which collects the light at such a distance from the drum that the latter shall be at its own focal length from the principal focus of heat of the former. By this means, the heat-rays are rendered parallel, and a temperature which at the focus of heat of the first lens will fire gunpowder, is reduced below 90° when the visual focus is formed after passing through the hemisphere. For the higher powers, where greater concentration of light is required, the ordinary achromatic condenser may be used, or in its place an object-glass of slightly lower power than the one in use. Dr. Maddox, whose work is unsurpassed for brilliancy and delicacy of definition, prefers an Abraham's achromatic prism for collecting the sunlight, which is condensed by a Coddington lens of small angular aperture. Another arrangement is described by Mr. Shadbolt. He places a small bull's-eye near the lamp, so as to collect the rays at an angle of about 100°, and it was arranged at such a distance as to fill a second plano-convex lens of great convexity, which threw the rays parallel or slightly convergent on the object; and this he considered a great advantage, for he found, and our own experience amply confirms it, that the quantity of light thrown on the object was not of so much importance as the direction in which the rays reached it. This may easily be proved by taking two photographs of an object with delicate markings in succession, the focus remaining the same, whilst the direction of the illuminating pencils is altered, very different pictures will be the result; and it will be found that a most intense illumination of the object will frequently give a hazy and unsatisfactory picture, owing to the false light which is boxing about in the camera. But perhaps the most perfect arrangement of condensers is that of the Rev. W. Kingsley, which consists of a system of lenses exactly like those he used for collecting the light, but

[1] Transact. Micros. Soc., No. 3, N.S.

smaller in size, and placed the reverse way—viz., with the meniscus next to the object, and the double convex lens placed so as to receive the rays before rendered parallel by the plano-convex between the condensers and collectors.

The various parts of the instruments employed in photomicrography have now been described, and the operator will doubtless be guided by the facilities at his command in the selection of the arrangement most convenient for his own use. Some remarks will be added on the practical working of the apparatus, and the precautions necessary before proceeding to take a picture.

Illumination.—Having selected a firm support for the camera, and ascertained that all is perfectly light-proof, our first attention must be directed to the "Illumination;" and it will not require much experience to convince the operator, that in this will lie the secret of success or failure in his subsequent operations.

For work in sunlight, the instrument should be placed with its long axis in a line with the sun's rays, and a light-coloured cloth or chamois leather thrown over all to protect it from the heat; the mirror is then adjusted so as to throw an evenly illuminated disc of light on the focussing screen, and this Mr. Traer found to be best effected, where the concave side of the mirror alone is used, by placing it at a distance slightly greater than its focal length from the object, so that the rays shall enter the instrument just after they have begun to disperse. Care will have to be taken that the lenses are not injured by the great heat of the concentrated sun's rays; with the hemispherical condenser of Mr. Reade, already described, this danger is easily avoided; it has also been suggested to pass the rays of light through some solution, such as alum, possessing the property of stopping the heat rays; but with care in the adjustment of the condensers, allowing the rays to cross before they arrive at the object, these expedients will scarcely be found necessary. With artificial illumination the difficulties, though differing in kind, are quite as great, and no time will be ill spent which is devoted to this preliminary arrangement of the light. The combinations for this purpose are so numerous that it would be impossible to describe them all; it will, perhaps, be better to give the arrangement which has proved successful in our own hands, and with which we are therefore most familiar. The source of light having been prepared, whether oil or oxycalcium burner, it is mounted on the stage with the microscope, so that its rays may be collected by an ordinary bull's-eye lens of three inch focus, and either thrown directly on the object, or still further condensed by one of the various lenses which have been described as used for the purpose. With the higher powers the bull's-eye has been adjusted, flat-side to the light, so as to fill a Reade's drum, and the rays being thus rendered nearly parallel, have been concentrated on the object by means of an achromatic condenser. Much care will be required in centreing the light so that all parts of the disc on the focussing screen may be evenly illuminated. The proper distance of the condenser from the object must be matter of careful experiment, and probably differs for every slide exposed. The only safe guide would seem to be the appearance of the image on the screen. It should be clear, sharp, and distinct, without any appearance of false glimmering light, and the condensers should be manipulated until a satisfactory view is obtained; light being in all cases sacrificed to clearness of definition. In some of M. Bertsch's experiments the field was almost dark from the obliquity of the rays required to bring out the finer markings of diatomaceæ on the focussing screen; and it will often be requisite to effect a compromise between the point of highest illumination and that of most perfect definition, in order to avoid the lengthened exposures which would be necessary to produce the most complete result with an artificial source of illumination. With a short camera these operations can be carried on by a single person, but with a camera of four or five feet, recourse must be had to the assistance of a friend, or to the plan described by Professor Rood, of placing a mirror opposite the focussing screen in such a position that the object thrown on to it is plainly visible to the operator at the farther end of the instrument. A satisfactory illumination having been secured, time will be saved by at once ascertaining the lengths of camera required with the various object-glasses to produce certain degrees of enlargement. This may be accomplished approximately by inserting a stage micrometer as an object, and carefully focussing the lines upon the screen; the camera is then lengthened or shortened until the required degree of enlargement is obtained, and the different lengths and the glasses required noted down for reference at any future time. Fifty, one, two, and four hundred diameters are, perhaps, the most useful degrees of amplification.

Correction.—When the above preliminary operations have been performed, an object may be selected with a view of ascertaining the correction required by each object-glass for difference of visual and actinic foci. This will of course be unnecessary with lenses specially constructed for photographic work, but with the ordinary microscopic glasses repeated experiments will be required, and the operator's patience will be tried to the uttermost before he arrives at any satisfactory knowledge on this point. Days will be well spent, however, in obtaining accurate results for the slightest error at this stage will inevitably result in uncertainty and dissatisfaction in the subsequent work. As the chemical rays are by the over-corrected object-glass brought to a focus farther from the object than the visual rays, it follows that if the latter be focussed on the screen, the focal plane of the former will lie at some distance behind it. The screen must therefore be moved farther from the object, so as to be in this plane, or, which amounts to the same thing, the object-glass must be moved from the object. The latter is the plan usually adopted, as it may be so readily accomplished by means of the fine adjustment. For the lower powers some hairy object may be selected, as suggested by Mr. Shadbolt, and a photograph taken at the visual focus; other hairs than those focussed will appear sharp in the negative, and if the number of revolutions of the fine adjustment required to alter the focus from one of these hairs to the other, on the object itself—from a hair focussed on the screen to a hair actually in focus in the picture—be ascertained, it will represent the amount of correction required for the lens and combination which may be in use at the time. It is not always easy, however, to ascertain the correction in this way, and numerous trials will probably have to be made before any certainty is arrived at. Picture after picture will have to be taken until the definition in the negative is the exact counterpart of that which we see on the focussing screen. As some slight guide to the beginner the following ascertained corrections are given, but each glass must be the subject of separate experiment, as even those by the same maker differ to a considerable degree. Mr. Delves asserts that no correction is required where direct sunlight is used for negatives, but his experience is not borne out by that of any subsequent observers, though Mr. Traer says that the foci of his lenses differed but slightly. Mr. Shadbolt's

$1\frac{1}{2}$ in. Smith and Beck required to be withdrawn 2 turns of the fine adjustment $= \frac{1}{50}$ in.

$\frac{2}{3}$ in. Smith and Beck required to be withdrawn $\frac{1}{2}$ turn of the fine adjustment $= \frac{1}{200}$ in.

$\frac{4}{10}$ in. Smith and Beck required to be withdrawn 2 divisions of the fine adjustment $= \frac{1}{1000}$ in.

In the glasses we have used also by Smith and Beck—

The $1\frac{1}{2}$ in. required 7 divisions only.

The $\frac{2}{3}$ in. required 4 divisions.

The $\frac{4}{10}$ in. required 2 divisions.

For $\frac{1}{4}$ in., and higher, Mr. Shadbolt found the difference of foci so slight as practically to require no correction, and this rule is confirmed by the experience of others; still there is a difference between the visual and actinic foci, even in the highest powers, and it cannot be neglected where the work to be done is of the finest description; thus, M. Bertsch found that using an objective with a focal length of only a demimillimetre ($\frac{1}{50}$ in.), he was obliged to make a correction of $\frac{1}{180}$ of a millimetre to bring out the finer markings on diatomaceæ; but if the screw collar usually adapted to these glasses be used, as it must in balsam covered objects, a new source of difficulty is introduced, and it will be hard to fix the amount of correction required without a long course of experiment with each object-glass and object. (Cf. "screw collar.")

Whether the same amount of correction will answer for lights obtained from different sources, appears still a matter in dispute. Mr. Shadbolt[1] is of opinion, that the distance between the two foci differs for every kind of light, whether camphine, or gas, or sunlight is used, and that even the direct rays of the sun differ in this respect from those which are reflected. Our own experience with oil and oxycalcium has shown no appreciable difference in the correction for those two lights, but more accurate experiments are needed on this point, as also respecting the corrections required for altered lengths of camera. Other means have been suggested for ascertaining the position

[1] Photogr. Soc. Journ., 1857.

of the invisible image; one most scientific in theory rests on the discoveries of Professor Stokes already alluded to, by which the invisible rays of the spectrum may be rendered visible on being intercepted by a fluorescent medium. It has been proposed to focus the chemical image on a screen formed of a fluorescent substance, such as Uranium glass, and Mr. Kingsley speaks highly of the plan, but we have as yet had no opportunity of putting it to the test.

Another method of some ingenuity, but of very partial application, has been practised by Dr. Henderson of Bristol; and our thanks are due to the honorary secretary of the Bristol Microscopic Society for permission to extract it from the unpublished minutes of the society. The camera was lengthened to its full extent; a $\frac{1}{4}$ in. by Nachet was used, and the focus of an object accurately taken on ground glass; a picture was then taken at the visual focus, the result, of course, being misty. This picture was now treated as a copy, and the camera run up until a fac-simile of it was seen on the ground glass. The camera was fixed at this point and the object moved away from the lens until it was in correct visual focus on the focussing screen. Another picture was then taken without any correction, and the result was perfect definition; a mark was made on the camera to show how far it was drawn out, and it was found that the distance between the lens and the ground glass was exactly sixteen inches whether the $\frac{1}{8}$ in., the $\frac{1}{2}$ in., or 1 inch were used; and the same results were obtained with lenses of Ross's make. The magnifying power obtained in this way is necessarily small, but the pictures may be enlarged by the ordinary camera lens; and some of Dr. Henderson's results, which include zoophytes and diatomaceæ produced in 1861, are proof of the accuracy which can be obtained by this method.

His $\frac{1}{8}$ in.	at 16 inches	gave	180	diameters.
„ $\frac{1}{4}$ in.	„	„	80	„
„ $\frac{1}{2}$ in.	„	„	40	„
„ 1 in.	„	„	20	„

Focussing.—For focussing the object a lens of some kind will be almost essential, and it is important to look through it always in the same way, as the focus on the screen varies materially as we regard it directly in a line with the light or obliquely. The micrometer eyepiece invented by Ramsden, carefully focussed on the collodion of the screen, will perhaps be found the most convenient form of lens; and if it be protected by blue glass, much relief will be afforded to the eye from the dazzling glare to which it is exposed. The greatest care should be taken to get sharp definition, and to be certain that the focus is taken from the near side of the object, or confusion will be the result when the finer lines on such objects as diatomaceæ are required; and Dr. Maddox has even found it requisite to rearrange the focus at the last moment, when photographing in a hot sun, owing to the alterations effected by expansions in the brasswork of the instrument during the preparation of the plate in the operating-room.

Screw collar.—With the higher powers another difficulty presents itself in the adjustment of the screw collar for thickness of covering glass. Professor Rood recommends that this be done after the connexion of microscope and camera is effected where no eyepiece is used, but in part before where the eyepiece is retained. Dr. Maddox sets the screw collar for the object in the microscope, using the lowest eyepiece; then focusses on the screen, and if the dark lines be not well rendered at the best visual focus, the collar is altered and the deviation recorded. When the focus has been thus obtained, the usual correction is allowed for visual and actinic rays, and the picture taken. At present it does not appear that any more accurate rule can be laid down than that the screw collar be manipulated until the best possible appearance is obtained on the screen, and then such correction allowed for difference of visual and actinic foci as may have been found necessary for the objective when used with an uncovered object.

A few words may be added on the strictly photographic portion of our subject, although it is beside the purpose of this paper to give in detail the solutions and manipulations which are to be found in every text-book.

First, "*the Plate*;" it should be of stout plate-glass or flatted crown of some thickness; well filed at the edges, to secure adhesion of the film during the numerous washings it will have to undergo, and this is the more necessary when artificial light has been employed and intensifying processes are resorted to. The "cleaning" is best effected with old collodion or with strong liquor potassæ, applied with a flannel roll, and the greatest care should be taken to render it effectual, or much disappointment will follow; the finest pictures are often rendered useless by some stain running across the plate, the result of carelessness in the first cleaning operations.

Collodion.—So many collodions are now prepared that it is hard to make a selection. "Perry's Bromoiodized" has been found well adapted for evening work, being sufficiently sensitive for the ordinary means of illumination, and giving a film of such consistence as to resist the washings it has to go through without the necessity of varnishing the edges; but many other kinds will doubtless answer as well, provided they be bromoiodized. Having once made selection, however, of a collodion, it will avoid at least one source of error if the same sample is adhered to.

No hand should touch the plate throughout the processes of cleaning, coating, and development: a brass clip guarded with varnish, and a common "limpet" or "suction holder" will answer every purpose that fingers can be applied to.

Operating-room.—When operations are carried on by artificial light any sitting-room will fulfil the conditions required, both for exposure and development. A candle shaded by a tripod stand of yellow calico, a steady table protected by a stout cloth, a bucket or basin, a jug and a good supply of water, will, with the necessary chemicals, go far towards completing the equipment of a photographic room.

Exposure.—The exposure is influenced by so many causes that it will be impossible to give more than the roughest approximation to the time required. Each mode of illumination, each length of camera, each lens employed, the chemical opacity of each several object and of the medium in which it is mounted, will affect the result. Thus the exposure with an oil lamp and $1\frac{1}{2}$ in. will vary from two minutes or less to half an hour, and there are many objects of such chemical opacity as to baffle all efforts to take a picture even at the longer exposure. With a camphine lamp Mr. Legg obtained images at a 3 feet camera with $\frac{2}{3}$ in. and $\frac{4}{10}$ in. in from four to ten minutes, and with an Argand burner and gas the exposure for a $\frac{4}{10}$ in. was from five minutes to a quarter of an hour. With the oxycalcium light the exposure is of course somewhat reduced, the $\frac{2}{3}$ in. requiring from three to ten minutes with ordinary objects mounted in balsam; but even with this light, by which an object like the cricket's tongue may be done with the $1\frac{1}{2}$ in. at 5 feet camera in less than a minute, a rather yellow foot of *Gyrinus natator* will be most imperfectly depicted in twelve minutes. During the long exposures, extending in some cases to more than forty minutes, when the plates are apt to become dry, a small saucer of hot water placed just inside the camera has been found to preserve the moisture of the plate, so as to allow of development being carried out without stain or inequality.

Fogging.—The dangers of fogging from over-exposure with artificial light are slight and unimportant; in sunlight, however, when the exposure is in many cases instantaneous and always reckoned by seconds in place of minutes, the greatest care will be required to avoid this constant source of disappointment. Other causes of "fogging" are not so easily guarded against, and are perhaps more common with a lamp than with daylight. One of these is the arrangement of the condenser, by which a quantity of dazzling rays may be introduced into the camera and sow the seeds of mischief, which will not perhaps attract notice until the intensifying process has been carried to a certain point; and a picture which at first looks satisfactory may be spoiled eventually by this cause. When the illumination has been perfectly clear without dazzling or glare, a fogged picture will rarely occur even after long exposure, either in the development or in the subsequent intensifying processes.

Development.—For developing pictures, especially after any lengthened exposure, a trough of glass or porcelain, as recommended long ago by Mr. Shadbolt, will be found almost indispensable. Without a contrivance of this kind it will be found very difficult to avoid stains from the unequal action of the developer when first thrown on the plate. A small silver crook may be used for raising the plates out of the trough; and when the bottom is of glass, a square of microscopic covering glass, cemented to the centre of it, will be of service in preventing adhesion, and consequent slipping of the crook, through which so many valuable pictures are lost. The developer may be any one of the ordinary iron solutions, such as (protosulph. iron, gr. xv.; acid glac. acet. ♏xij.; alcohol, ♏xij.; dist. water, ℥j.); and it is possible to economize, without any loss of cleanliness or sharpness in the picture, by making the same developer serve in some cases for weeks, by constant filtering of the solution after the addition of a few grains (gr. cxx., ad Oj.) of protosulphate of iron.

Intensifying, if required at all in pictures taken by sunlight, is a simple process, and is best done at once. When lamplight is used, however, and feeble exposures are met with, it becomes an important operation, and demands the greatest care. It may be either done at once by the ordinary nitrate of silver and pyrogallic process, or the picture may be first cleared and put away until it can be completed; and this will be found a most convenient plan for those whose time is much occupied, as many pictures may be taken in a short space of time—a great gain where so many experiments are required; and as the intensifying process may be carried on in daylight, any leisure hour may be employed in the subsequent operations. The edges of the film having been secured by a slight coating of varnish, the plate is first washed with water and then flooded with saturated solution of iodine in water. It is again washed, and a solution of pyrogallic acid gr. ij., citric acid gr. j., distilled water ℥j., poured on, at first alone, and afterwards with a few drops of 20 grain solution of nitrate of silver, which may be cautiously added until the required intensity is obtained. Care should be taken not to carry this process too far, or a woolly, mealy condition of the film is induced, which is very apt to interfere with the finer details of the picture. It is perhaps better to repeat the intensifying process at two or three separate times, taking care to throw away the solution on the least appearance of cloudiness or deposit, as it is then apt to cause fogging and stains in the picture. After thorough washing the plate is set on its edge to drain on a sheet of clean blotting-paper, and, when dry, varnished, and carefully put away in a box.

Dry Plates.—The attention of photographers has of late been especially directed to the various dry processes which have been proposed, and there is little doubt that much advance will be made in this direction within the next few years. By means of the alkaline development, exposure has been already very much reduced, whilst plates have recently been made of the greatest sensibility. For microscopic work a good dry process would possess many advantages under certain circumstances, the plates being always ready and adapted to the most lengthened exposures; pictures, however, may be taken on the sensitive plates supplied by Messrs. Hill and Norris with $1\frac{1}{2}$ in., at 3 feet camera, and using an oil-lamp, in a little over seven minutes.

Stereoscopic Pictures.—At a time when every landscape is represented in relief, it is scarcely to be wondered that attempts have been made to represent microscopic objects in the same way. The idea was suggested as early as 1853 by Professor Wheatstone,[1] and put into execution by Professor Rood and others. It was reserved, however, for Dr. Maddox to show the full extent to which this beautiful adaptation could be applied. In his slides diatomaceæ are represented with their facets standing out in relief as they have never been

[1] Quar. Journ. Micros. Soc., No. iv. O.S., "On the Binocular Microscope and Stereoscopic Pictures of Microscopic Objects," July, 1853.

seen before. The most perfect way of obtaining a stereoscopic effect would be by a microscope, "in which the tube could move, independently of the fixed stand, round an axis, the imaginary prolongation of which should pass through the object. A motion of 15° would include every difference of relief, and it would be indifferent in which direction this movement were made in respect to the stand;"[1] but as this would require a special adaptation of the microscope, other and simpler methods have been adopted. One consists in turning the object round an imaginary axis within itself from 7° to 15°, which may be done by means of an extra stage, as described by Professor Rood. This is easily constructed out of a piece of zinc made like a tray, sufficiently wide to admit of a second tray with the object-slide upon it to work on a pivot attached to its sides. A see-saw motion is thus obtained, care being taken that the inner tray be so slung that the imaginary axis round which the slide moves shall pass through the plane of the object itself. It is important also to have the light perfectly diffused and uniform, and it will cost some trouble so to adjust the object in the field that on the depression of either margin the opposite one shall be found in exact focus and evenly illuminated; but when this is done, and a picture taken first with one side depressed, and afterwards with the other, the results, when combined on a stereoscopic slide, will throw the object out in bold relief. A simpler method is to cover each half of the lens of the object-glass in succession, so that first one side of the object is taken in focus and then the other; the two pictures, when combined, give a stereoscopic effect, but great care must be taken in moving the mirror, or the result will be distorted. A third plan, which succeeds very well when objectives of large angular aperture are employed, is simply to take two pictures, one having a right-handed and the other a left-handed illumination.[2]

Objects.—Success in the illustration of microscopic objects by means of photography will always depend, in a great measure, on the judgment which is exercised in the selection of specimens. The art is not adapted to the representation of all, but the limits are pretty clearly defined within which it can compete successfully with all other modes of illustration, and nothing will be gained by pushing it beyond its capabilities. Opaque objects have been photographed through the microscope, but we have not seen any which might not have been done better by the pencil; still it may be useful in certain cases to depict them in this manner, and Mr. Kingsley has produced some interesting results from giving very long exposure to fragments of fossil bone.

It is generally desirable to get the object as flat as possible, with its definition as nearly as may be in the same plane; the colour also should be such as to admit of the free passage of actinic rays. A few of the most suitable classes of objects may be mentioned here. Vegetable tissues, such as cuticles with the hairs, cells and ducts, woody

[1] Quar. Journ. Micros. Soc., No. iv. O.S.
[2] Cf. Quar. Journ. Micros. Soc., No. ix. N.S., Jan. 1863.

fibre, sections of wood both recent and fossil; whole plants, as the algæ, including diatomaceæ and desmideæ—club-mosses. Amongst animal structures may be noticed infusoria, sponges, zoophytes, insects, entire as in small flies and parasites, or in separate parts, especially the feet, tongues, and tracheal apparatus; palates and shells of mollusca. From the higher animals may be obtained blood-globules and cells of all kinds—sections, fossil and recent, of bone, teeth and epidermal structures; together with muscular, nervous, and other fibrous tissues. Amongst morbid specimens, sections of tumours, casts of the renal tubes and the various crystals which appear in morbid urine. Any of the above will be found to fulfil the conditions mentioned, and to afford suitable subjects for photographic delineation, provided they be carefully prepared for the purpose. When the colour is of a reddish or yellow hue, as in many insects and fossil sections, it will be advisable to bleach the specimen before mounting by soaking in some fluid, such as chlorine water or strong liquor potassæ, and afterwards in glycerine, varying the solution according to the chemical composition of the object. Fine objects, such as diatomaceæ, may in some cases be mounted dry and uncovered, in order to avoid the alteration of the screw collar for the thin glass where the higher powers are used. A small box will carry a great number of these thin glass slides, and when wanted for use they can be mounted on a perforated zinc or glass plate by means of an india-rubber band. Little attention has hitherto been paid to the action of the various media in which objects are mounted on the actinic rays; but the experiments of Professor Miller[1] are sufficient to prove the importance of the subject. He gives a table of bodies in the order of their diactinism, or powers of transmitting chemical rays; thus, according to his later and corrected paper, the relative length of photographic spectrum, taking one millimetre as the unit of scale, is with water (which is freely diactinic), 74; with corrosive sublimate (a saturated solution), 32; with alum and with alcohol, 63; with wood spirit, 20; with glycerine, 18; ether, 16; lastly, with terchloride of phosphorus, which, though perfectly limpid and colourless, arrests all the chemical rays, 0. It would appear, also, that the covering-glass may not be disregarded when the greatest accuracy is aimed at, for it was found that, taking the same unit as for fluids in the above experiments, quartz gave a spectrum represented by 74; thin microscopic glass, 20; mica, 18; window sheet glass, 16; plate glass, 15; crown glass, 10; flint glass, 9; Faraday's optical glass, 5; the most diactinic of all bodies being rock crystal.

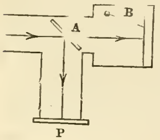
Polarizing objects may be represented in photography, as has been shown by Professor Rood's experiments on the cross and rings in starch granules. His method is thus described:

[1] Proceed. Royal Soc., vol. xii.; also, "On the Photographic Transparency of various Bodies and on the Photographic Effects of Metallic and other Spectra obtained by means of the Electric Spark," by W. A. Miller, Phil. Soc. Trans., 1863; quoted in Journ. Chem. Soc., Feb. 1864.

"A Nichol's prism is placed under the stage, one also directly behind the objective, sunlight is reflected from the mirror, and one of the prisms revolved till the field is dark; with the low powers, by this simple arrangement, photographs of objects may be obtained which exhibit the structure revealed by polarized light. For higher powers it is necessary to use the polarizing arrangement described by Von Mohl,[1] and recommended by Carpenter—i.e., the light from a large Nichol's prism is concentrated on the object by an achromatic condenser. The selenite stage can be used when it is found desirable. By arranging the apparatus according to the plan adopted by Professor v. Kobell, in his microstauroscope,[2] the peculiar effects which microscopic crystals produce on the cross and rings of calc spar can be photographed. By removing the condenser and objective, as well as the slide containing the crystals, beautiful photographs can be obtained of the normal cross and rings; the systems of rings in other crystals can be photographed by substituting them in place of the calc spar, as well as the changes which they undergo by combination with plates of double refracting substances (circular analysis, &c.), it being merely necessary to introduce the plates or films at the proper position."

M. Bertsch has also experimented with crystals of salicine, and Mr. Davis[3] exhibited most successful pictures of crystals of tartrate of soda, sulphates of copper and magnesia, and of santonine, before the members of the Microscopical Society, in the summer of 1862. A practical remark may be quoted from Mr. Davis's paper: he says that "when the object on the slide appears most perfectly illuminated by the ray which has passed through the lower prism, we often find that the image in the camera is but partially distinct, and that we shall be obliged to make a new adjustment of the mirror to procure an impression which will develope uniformly. The results are better when the selenite plate is not employed, and the analyzing prism is placed immediately over the object-glass."

Living Organisms.—Professor Rood has shown that even living objects are not beyond the range of microscopic photography, and he has described an arrangement for taking them which certainly has the merit of ingenuity. A glass, A (*vide* figure), is inserted into the tube outside the camera at an angle of 45°, and immediately over a second tube opening downwards, at the bottom of which a ground glass, P, is placed equidistant with the exposing frame from the glass at A. An exposing flap works inside the tube at B, by which the plate can be protected until the proper moment. By this arrangement the living creatures can be focussed, when at rest, on the glass at P, and watched during the exposure given at the same moment by opening the flap at B.



M. Neyt[4] has also described a process by which minute objects are killed instantaneously, when they have been brought into a proper position, by means of a Daniell's battery or a small induction-coil;

[1] Pogg., vol. cviii. p. 178. [2] Silliman's Journal [2], vol. xix. p. 425.

[3] Quar. Journ. Micros. Soc., No. xi. N.S., "On Photography of Magnified Objects by Polarized Light," by Thos. Davis.

[4] Photogr. Journ., May 15, 1862.

but it would not seem to combine the advantages of the plan proposed by Professor Rood.

Printing.—The manipulations in printing are extremely simple, and a description of them may be found in any text-book on photography. One or two cautions, however, may be of service. Especial care must be taken to secure perfect contact of the negative with the paper, or the delicate detail of a microscopic picture will not appear with sharpness and vigour in the print. In the case of amateurs, where the time for work is probably short and at uncertain intervals, some contrivance by which sensitized paper or untoned prints can be kept unaltered for a length of time becomes almost essential. The ordinary preservative tubes and boxes sold for this purpose are useful, and will keep paper perfectly dry and unstained for months. The precaution, however, of allowing it to absorb a certain amount of moisture, or thoroughly drying every portion of the printing-frame, will be necessary before printing, as the paper, from its excessive dryness, absorbs moisture unequally, and cockles even under the closest pressure. Should a preservative-box not be at hand, it is useful to know that, by making the bath in which the paper is sensitized thoroughly acid in reaction by the addition of strong nitric acid (♏xx. ad Oj. of Bath), the keeping properties of the paper will be greatly increased, without in any way diminishing its other good qualities.

With regard to the size of negatives suitable for book illustration, Mr. S. Highley tells us that a demy octavo, with two negatives to a page, will only allow of the plates being four inches square; a demy quarto will take four negatives to this size, or two of five inches square; a square octavo takes one of the latter size.

In connexion with the illustration of works by photography, the process of printing has the greatest interest, and is engaging the attention of many at the present time. Permanency in the print, by the introduction of some body more staple than silver, and facility of reproduction by the substitution of an engraved plate and press for the glass negative and tedious process of printing by sunlight, are the two main directions in which improvement is sought. The gift-books of last season have shown what can be done by means of photographic illustration; but no fact can be more certain than this, that so long as silver continues to form the basis of photographic prints, there can be no hope of their permanency. We are working for the day only, without a thought for the future. "Things of beauty," which should be "joys for ever," will be fading away when we have learned to value them most; the treasures of a generation will pass slowly and irrevocably from our possession. The attempts, therefore, to substitute carbon compounds for silver deserve the most careful consideration. From the very earliest days of photography, as far back as the year 1814, it was known that the bitumen of Judæa was acted on in a peculiar way by light, and M. Niepce has been most diligent in his endeavours to bring the art of printing in this and allied substances to a practical issue. In England, also, the subject has long occupied attention, and in some hands has been brought to considerable perfection; but no real advance can be made so long as light is required for the production of each separate copy of the picture. The liability to breakage and other damage of the glass negatives, even with the greatest care, and the time occupied in taking and finishing each impression, will form insuperable barriers to operations on a really large scale. It has been suggested, therefore, to transfer the negative by direct printing to a plate of zinc or steel, from which, when properly etched, any number of copies may be struck off in the ordinary way. A mixture of bichromate of potash and gelatine has been discovered to possess the property of becoming insoluble in water on being exposed to the action of light; when, therefore, a polished surface is coated with this compound, and exposed, as sensitive paper might be, with a negative to the action of the sun, its separate portions are rendered insoluble in various degrees; and if the whole plate, after printing, be covered with lithographic ink, and dipped into water, those portions which have been least acted on by light are dissolved out, and the required picture remains; this may be transferred to a prepared surface of zinc, from which any number of copies may be struck off in lithographic ink. In this way Sir Henry James, at the Ordnance Office, Southampton, has produced on zinc plates, under the name of "photozincographs," the most faithful copies of maps and ancient documents; and a beautiful specimen has lately been published, to illustrate an article on the subject of "Photographic Printing and Engraving," by Mr. Crookes, F.R.S., in the 'Popular Science Review' for October, 1863. It is a perfect reproduction of a sheet of the 'Times,' with every letter distinct, printed from a photograph transferred to stone, in the space of an octavo page. The plate which accompanies this paper is also a photolithograph, and is a fair example of what may be done by the process in the way of microscopic illustration.

With a compound similar to that mentioned above, Mr. Fox Talbot takes an impression of a negative on a steel plate; the soluble parts are then dissolved out with water, and the plate etched by chemical means. Great difficulty, however, has always been found in making the ink adhere where half-tones are required, as in portraits or landscape; but a great deal has been done, and by the use of a coating of finely-powdered gum copal sprinkled over the plate, Mr. Talbot has succeeded in producing some very beautiful results.[1] Mr. Duncan Dallas[2] has also recently introduced a method of reproducing a negative by a process which he terms "photoelectric engraving." It is done at about one-third the expense of engraving by hand. Much may be expected from this, as well as from the "photogalvanography" of Mr. Paul Pretsch; and when these various processes shall have been so far perfected as to be generally adopted, a new era will commence for photography, and we shall work with the assurance that the illustrations will exist at least as long as the text which describes them.

Microscopic demonstration.—Although not immediately connected

[1] Mr. Talbot has named his process "Photoglyphy."

[2] Phot. News, Jan. 1, 1864.

with photomicrography, it may not be out of place to mention a use to which the apparatus employed in these operations may be put. Mr. Highley was, we believe, the first to suggest that microscopic objects might be most conveniently shown by using the microscope and camera as a sort of magic lantern, giving the greatest delicacy of detail, and the most perfect facilities for demonstration to a class; and more recently Dr. Maddox[1] and Mr. Wenham have drawn attention to the same subject. By throwing a strong light on the object, and guarding the eye with the red and green glasses from a sextant, they were enabled to bring out the finest test-markings on a screen with perfect ease; and with an achromatic condenser and direct sunlight, the circulation of sap in "anacharis" was beautifully shown. The same arrangement may also be employed for facilitating the drawing of diagrams for lecture purposes, as, by a little management, the image may be thrown on a large sheet of paper, and traced off in crayons with the greatest readiness and ease at any size required.

Lastly, positive transparencies taken from the negatives of microscopic objects, form the most useful magic-lantern slides, and may be coloured in any variety. Mr. Highley has done much to advance this branch of illustration, and it promises to be of considerable service in the promotion of popular education.

Before closing this article, it may, perhaps, be useful to inquire why photomicrography is still almost in its infancy, to examine briefly the objections which have been raised to it, and, finally, to add a few words on its scope and bearing on scientific illustration. Nothing can appear more simple to the ordinary observer than the combination of microscope and camera, and yet difficulties arise, as we have seen, at every step when we come to carry out the various processes in detail. Not to speak of the rare combination in the hands of one person, of such costly instruments as a microscope and a camera, as well as the apparatus for producing oxycalcium or other good photographic light, if time and opportunity do not allow of day-work, the mere trouble and annoyance of the manipulations and processes requiring such delicacy and perseverance, would be sufficient to deter a great number of would-be workers; still, with every advance in photography, the practical applications of its various branches will become more easy and accessible; even now dry plates of very great sensibility may be procured, microscopes and cameras are being multiplied and reduced in price, so that we need not despair of some day seeing the practice of photomicrography within the reach of any one really desirous to record for himself the results of his observation. Other objections which have been urged against photomicrography are chiefly based on optical grounds. It is said that its range must always be limited, for it can only represent objects which are flattened, or have all the separate parts lying nearly in a plane; and this is doubtless true, as far as it goes; but the fact that an art is not applicable in all instances, surely affords no ground for its rejection where it is of undoubted ser-

[1] Quar. Journ. Micros. Soc., No. xii. N.S.

vice. In large classes of objects a sufficiently flat field is obtained even for the higher powers, and Dr. Maddox has proved that the finest definition in diatomaceæ (such as pleurosigma angulatum) may be produced almost in *fac-simile;* his stereoscopic slides of discs from Barbadoes earth are triumphs in the art, which will go far to extend its sphere of usefulness. But even when the field is uneven, we have seen that the difficulty may be surmounted to a certain extent by a species of composition, as used by Mr. Wenham; and though it may be impossible in this way to reproduce a whole as symmetrical and artistic as the work of a skilled draughtsman, still the results we obtain will be true to nature, there will be no distortion of parts, and in many cases we shall be able to obtain definition which in its delicacy and intricate variety would prove more than a match for the most experienced pencil. Photography will hold its place, for it has truth as its foundation, but that place will inevitably be rather the handmaid to art than art itself in the highest sense of the word; for while art deals chiefly with our conceptions of the actual and the beautiful, photography is concerned with bald representation and reproduction—the one revels in the ideal, the other in the actual. The ordinary photographic portrait, giving the studied expression of a moment, can never vie with the creations of a Richmond or a Lawrence, in which the thought and action of a lifetime seem concentrated and embodied—to live and tell their own story from the canvas. But in the branch of photography at present under consideration, expression has no place—truth is the great desideratum. In certain classes of objects it can be faithfully rendered, in others it can only be obtained piecemeal, but even here photography is not without its value, for it will enable the limner to build up a consistent whole from the separate parts presented to him. It will be seen, then, that the scope of photomicrography is not so limited as it at first sight appears. When the mechanical difficulties which now attend it have once been surmounted, pictures of large classes of objects may be produced, which in delicacy of detail will rival those obtained by any other means. It is not unreasonable to expect, as the result of the extension of photomicrography, more full and accurate illustration of publications on scientific subjects, and a considerable reduction in the expenses attending it. It will be in the power of any individual worker to produce an equivalent to the graver's plate, for the picture, once secured in the negative, will always be capable of indefinite multiplication. It will be possible, without the aid of a skilled draughtsman, to record passing conditions or doubtful and interesting appearances, in a form which could not fail to carry conviction when the evidence of the pencil or the memory alone might, by lapse of time and other circumstances, be open to doubt even by the observer himself. It is difficult as yet to realize adequately the improvements of which this art is capable; that it has not hitherto made much progress is owing to peculiar circumstances attending the working of it rather than to any inherent difficulties in the art itself: with a change in the conditions under which it is at present practised, photomicrography will doubtless claim for itself a higher position, and become one of the most useful and familiar means of microscopic demonstration.

Review II.

1. *On the Diseases of Women.* By Fleetwood Churchill, M.D. Fifth Edition.—*Dublin*, 1864. pp. 928.
2. *The Diagnosis and Treatment of Diseases of Women.* By Graily Hewitt, M.D.—*London*, 1863. pp. 619.

Truly astonishing is the amount of attention given in the present day to the subject of female diseases. Whatever the ladies may in other respects have to complain of on the part of the stronger sex, neglect of the study of the numerous diseases they are liable to cannot be laid to our charge; for in this respect a species of gallantry has arisen which is exuberant in its growth and most industrious in its application. We have now before us three new books, two of large dimensions, and one smaller, all of which exhibit proofs of considerable labour and devotion of thought to the subject of the diseases of women. One of them, the largest, is from the pen of Dr. Fleetwood Churchill, containing upwards of 900 closely printed pages, and affording in itself the best evidence of its utility, its being a *fifth* edition. The fourth edition was published in 1857, and was reviewed, or rather noticed, in our volume of that year. Previous editions had also been recommended by us to the favourable notice of the profession, and the work is by this time so well known to most of our readers, that it would be superfluous to devote much space to the consideration of what requires only its own well-established character to commend it to the rising generation of obstetric practitioners. The present work contains many considerable additions, the result mainly, the author says, of an increased experience, and many new illustrations have been added; but we do not find what we ventured to consider an omission in a former edition supplied in the present—viz., the comparative absence of information upon the subject of syphilitic affections of the uterine organs. In our Bibliographical Record, 1857, we expressed a belief that a chapter might have been advantageously introduced, embodying the various facts which have been collected on this subject by various writers, but the author, probably for some reason satisfactory to himself, has not adopted our recommendation. We still think it a subject worthy of his consideration, and of great social and scientific importance, although not quite to the extent that some modern writers would lead us to imagine. Of Dr. Churchill's work generally we would say that it contains almost everything that can be desired, both as to his own opinions and those of others, for the profitable study of the diseases of which it treats; and we now again, as we have done more than once before, strongly recommend it as a comprehensive and strictly practical work.

The other work on diseases of women, whose title is given at the head of this article, is founded on a course of lectures delivered by Dr. Graily Hewitt at St. Mary's Hospital Medical School, the first and principal part being devoted to the elucidation of the diagnosis of the diseases peculiar to women, including the diagnosis of pregnancy; and the second part of the work to the consideration of their treatment. The author lays great stress upon the value of diagnosis, "without which no advance can be made but on the imperfect basis of surmise and conjecture. Everything, in fact, turns on the diagnosis, and, once the diagnosis has been made, the path is comparatively clear." He says the primary object of the work is to afford increased facilities for diagnosis, and he has adopted a peculiar arrangement of the subject for the purpose of carrying out that object in the most efficient manner, symptoms, not pathology, having been made the basis of the arrangement. Those who study the work will judge how far the above object has been attained. No doubt the subject of diagnosis is in all divisions of medical inquiry of very great importance—nay, it is indispensable for the right treatment of diseases; but we cannot go quite to the length of the expression that when once the diagnosis has been made, the path is comparatively clear; for sad experience proves in many cases, very many, indeed, that it leads to no very certain treatment. No doubt a true diagnosis does often direct us at once to a successful treatment; as often, perhaps, it discovers to us our total inability to cope with the disease it reveals; and very often again we treat diseases successfully by the aid of *experience*, without a full knowledge of their diagnostic characters. While therefore we might say with Dr. Walshe, in answer to "What is the first object to be attained by clinical observation?" Diagnosis; "What the second?" diagnosis; "What the third?" diagnosis,—we should with equal emphasis urge the claims of experience, that of ourselves and of others, to be stored up in our minds and memories as a treasury from which we may draw guidance and assistance in the treatment of disease. Watts says, "Physicians, by treasuries of just observations, grow to skill in the art of healing;" and certainly nothing could more benefit us in the practice of our very difficult profession than a well-arranged and faithfully recorded number of reliable *facts in physic*.

After a few very sensible preliminary remarks on the general method of examining and "taking" cases, our author begins the first part of his book "Diagnosis," dividing it into two sections, in the first of which are considered the data for diagnosis obtainable without physical examination, embracing the age and sexual relations of the patient, menstrual derangements and external hæmorrhages from the generative organs, substances expelled, non-sanguineous discharges, disorders of micturition, symptoms referable to the rectum, abnormal sensations, nausea and vomiting. In the second section are considered the morbid conditions of the external and internal generative organs, tumours, displacements, examination of the uterus by the sound and by the speculum, enlargements of the abdomen, &c.

The second part of the book contains fourteen chapters on the treatment of the various disorders and diseases to which the generative organs, including the urethra and bladder, are liable, as well as of the diseases of the ovary, peri-uterine hæmatocele, pelvic abscess, and diseases of the Fallopian tubes. It will be impossible to enter minutely into these numerous subjects within the limits prescribed for our review; and having stated what is the plan, and what are the contents of the work, we shall restrict ourselves to making a few critical and analytical observations, and leave the rest for the readers of the work to study and digest.

Of the book generally we may fairly state that, without possessing any great originality, it is a very useful student's manual, and fully bears out the intention of the author that it should form an introduction to the study of the diseases of which it treats; and more than this, we fully acknowledge its claims to be considered a very useful work for practitioners, both small and great, to ponder and refresh themselves withal. With less pretensions, and (without any disrespect to its author) with less completeness than the admirable work of Dr. Churchill, it is nevertheless more readable, and is not likely to be read without advantage. The third chapter, on Menstrual Derangements, gives a very good and practical view of the subject, and suggests an interesting inquiry—namely, When the menstrual secretion is arrested, and the general health becomes affected, which of the two is cause, and which is effect? Is the failure of the general health the cause of the menstrual suppression, or is the menstrual suppression the cause of the failing health? It is of course self-evident that the success of treatment must very much depend upon the right solution of this question, and no doubt, *generally speaking*, the view adopted by the author and many others, that the general indisposition so often coincident with amenorrhœa is the cause, and not the effect, of the latter, is correct. Still, it is an indisputable fact that the converse is true; that the general health suffers for want of the periodical discharge, and that the plethora, headaches, neuralgic pains, losses of blood from other organs, palpitation, with flushing instead of pallor, pelvic weight and uneasiness, rapidity of pulse with fulness, are indications of the interruption being the cause, and not the effect, of deterioration of health. In the same chapter is a remark to which we are always anxious to direct attention, and which continued experience proves to be very often neglected almost to the sacrifice of valuable lives—*that a vaginal examination is always necessary where hæmorrhage occurs or continues in a case of suspected abortion.* Reference is also made to an important class of cases seldom noticed by authors, where profuse menstruation occurs near or at the period of cessation—*climacteric menorrhagia*—and of which a fuller description is given than we have seen elsewhere, at p. 153 of 'Records of Obstetric Consultation Practice,' published a few years ago by Dr. Copeman of Norwich.

Contrasting Dr. Graily Hewitt's work with that of Dr. Churchill, we find the former author in chap. v., "on non-sanguineous discharges," page 93, referring specially to the syphilitic and gonorrhœal, as established forms of leucorrhœa. He says :

"There appears unquestionably to be a *syphilitic leucorrhœa.* It may be considered as probable that it is present when the leucorrhœa has been present for some time, associated with frequent previous abortions, or birth of dead children; when secondary syphilitic affections of the throat, skin, bones, &c., are present; but, above all, when it appears to be influenced by the administration of anti-syphilitic remedies. On external or internal examination, condylomata, ulcerations, or other characteristic evidences of syphilis, may be observed. The discharge from the vagina is said to be often very great in quantity in these cases, to be yellowish in colour, and to contain much mucus. On these latter characters little absolute reliance can be placed for purposes of diagnosis."

In most of these remarks we entirely agree with our author; but we should decidedly hesitate in pronouncing any vaginal discharge to be *gonorrhœal,* if the urethra was not implicated, and urine could be passed without pain ; or *syphilitic,* when there were no signs of chancre, bubo, or the presence of acknowledged secondary or tertiary symptoms of venereal disease. It must often be a very difficult point to determine; and subject as it is to many fallacies, *unless positive signs are present,* the greatest caution ought always to be exercised in venturing a decided opinion in the matter. We confess, also, to not having absolute faith in the diagnostic value of the effect of anti-syphilitic remedies, for they often act beneficially in other diseases unconnected with venereal contamination. If we adopt the principle, that *because anti-syphilitic remedies prove beneficial, therefore the disease must of necessity have been syphilitic,* we may be led into error, and incur the risk of very unjustly suspecting the morality of our patients. Speaking of ulcerations due to syphilis, Dr. G. Hewitt says, they have a predilection for the internal or mucous surface of the vulva, and especially the labia minora. Chancre of the os or cervix uteri presents an appearance like that of chancre elsewhere ; and respecting secondary syphilitic eruption or ulceration of the os and cervix, "it does not appear that there is anything peculiar about the character of the ulcerations which would enable us to say at once that such and such an appearance was due to syphilis." In pursuance of the subject of the influence of syphilis, we quote the following remarks :

"It is well known that the presence of syphilitic disease in either parent is frequently the cause of abortion or of premature birth. It may be questioned, however, whether the presence of syphilis is not occasionally the cause of sterility by destroying the product of conception at so early a period of the pregnancy that the very existence of pregnancy is, for that reason, unrecognised, the woman being really capable of conceiving, but the product of conception quickly perishing. The effect of syphilitic disease, in disturbing the normal growth of the decidua at the commencement of pregnancy, has hardly been, as yet, the subject of attention; but it is quite possible that disease of the decidua of a syphilitic character, may come hereafter to be a recognised pathological condition." (p. 434.)

On referring to the important subject of the diagnosis of pregnancy, we are surprised at the little value accorded to the placental souffle.

Indeed, it appears to the author to be of no value at all, for he says it is now almost universally conceded that it is worthless as a sign of pregnancy:

"No dependance whatever is to be placed upon it as a means of distinguishing the enlargement of the uterus due to pregnancy, from other forms of enlargement of this organ. In point of fact, the retention of this sound among the signs of pregnancy is of no real service, and is likely to attract attention which would be more profitably spent in searching for the sound of the fœtal heart. It is the fœtal heart-sound, *and that alone*, in which any confidence can be placed in respect to all the signs derivable from auscultation."

We quote this passage for the purpose of endeavouring to refute it by a counter statement, which is, that we believe the placental souffle to be one of the most valuable signs of pregnancy, second only to that of the fœtal heart, and the most dependable of all signs when the child is dead. We have, within a few months, been called upon to decide upon the existence of pregnancy in three very obscure and difficult cases, two of them being in an earlier stage than that in which the fœtal heart can usually be heard. In each case we detected the placental souffle, and upon that sign chiefly, and in one case almost entirely, our judgment was correctly formed as to the condition of pregnancy. To a practised ear, the sound is peculiar and distinctive; and we have never heard one like it caused by other uterine enlargements, or by pressure on a large artery. It is difficult, if not impossible, to describe it; it is not the blunt sound, or knock, such as the aorta gives if heard through a solid tumour situated over it; neither is it like what is occasionally heard—a kind of humming noise, when the stethoscope is placed upon a large vascular ovarian sac; it is a softer sound, something like a guttural pronunciation of the word woof, synchronous with the heart's action, such as might be expected to be produced by forcing a fluid, *per saltum*, through a sponge; and towards the end of pregnancy it is so loud as to be accompanied with a twang or ringing noise. In fact, it is very much like what might be expected to be produced by the circulation of the mother's blood through the porous or cellular structure of the placenta, a physiological condition on which we believe the sound does in reality depend.

The second part of Dr. Graily Hewitt's book will be read with interest; it is a condensed *résumé* of what is known upon the various subjects treated of, intermingled with which are not a few original views of practical utility. We have not space to remark upon it further than to say that the whole work is a highly creditable performance, and one likely to add to the already well-earned reputation of the author.

Review III.

Scritti Medici editi ed inediti di Francesco Casorati. Vol. I. *Trattato delle Febri Intermittenti, &c.—Pavia, Milan,* 1863. pp. 387.

A Treatise on Intermittent Fevers. By Francesco Casorati, Member of the Royal Lombard Institute, &c. With Biographical Notices. —*Pavia* and *Milan,* 1863.

The circumstances under which the present publication issues from the press are sufficient, were it needed, to bestow on it a certain degree of interest in addition to the intrinsic value of its contents.

In 1827, Francesco Casorati, of a family devoted to medicine, was taken from an obscure country *condotta,* at the recommendation of the celebrated Scarpa, to fill, at the age of thirty-four years, a medical chair in the University of Pavia. His teaching in that city became in much repute, and the high character and extent of his many contributions to the 'Gazzetta Medica' of Milan testify to his ability and industry. After the troublous times of 1848, Casorati was compelled to retire into Piedmont, and he died in the early part of the year 1859, failing by a few months only to witness the liberation of his country. It was under the unsettled circumstances of his later career that he found time to put together the posthumous treatise which engages our attention, that division of it which concerns treatment being found at the time of his demise to be not fully completed. We have to regard the present work as an instalment of the fruits of his pen, others of which may follow in succession.

Casorati was a man of fervid temper, a strong rather than a refined reasoner, and of a character of mind eminently progressive. He had early and through life witnessed the lamentable consequences which ensue on a too empirical treatment of intermittents in the blind use of quinine, stimulants, and purgatives, and it seems his endeavour in the work before us to bring about a better-reasoned consideration of their pathological phenomena, and to lay the foundation of an amended *praxis.*

The political and social connexions of Great Britain with her foreign dependencies in less temperate regions of the globe establish for her a community of scientific interests with those dependencies which adds considerably to the importance of the work we are considering. Some of us at home, for want of wider experience, may feel a mental shock in the course of its perusal, at finding our preconceptions of the origin and essentiality of intermittent fever somewhat rudely disturbed. The same may be said as to the individuality which has been conceded to its several complications, leading to multiple indications of treatment, and a headlong jumble of remedies, which, as our author teaches, serve to irritate when they should soothe, and which when they soothe betray. Forasmuch as Casorati aims not so much at anything novel in theory, but strives only for correctness of principles, he draws all the light he can from whatever has been written before his time. We are thus liable to see our most cherished notions traced to some effete foreign source long ago consigned to the grave of the Capulets; we may find ourselves roused from a circle of ideas that were current in the days of Molière,[1] or such as in a later day coalesced with the extravagances of Brown. In the performance of our duty of reviewing the present work, we desire to give the reader some nsight into the nature of these diseases as they appear in the valley of the Po, and of the principles which guide their treatment. We could wish also it might be seen, that though differences of climate lead to different and varied methods of treatment, yet that the conclusions of reason and experience may be found not to be more divergent than the natural phenomena and conditions to the consideration of which their powers are applied. Empiricism in its ill successes may be content, perhaps, to hold its hand awhile, and to borrow a thread of argument from its accusers, wherewith, without limiting its field of usefulness, it may eventually improve its results, and get a new lease of reputation built on a sounder basis of truth.

Casorati divorces himself from all the theoretical doctrines which have influenced each in their turn the medical schools of Italy. Accustomed to reason only from demonstrable facts, it even seems to us that it is with something of constraint he quotes the law enunciated by Von Helmont, that our organs alternately rise into activity and subside into repose.[2] He is constrained also to take account of those modes of relation which exist between organs, and also of the correspondence and antagonism which are observable in their functions; for example, between the skin and the gastro-duodenal mucous membrane, and also between this mucous tract, so rich in nerves as well as vessels, and the organs of innervation, &c.; such have been generally insisted on by pathologists from Cullen and his predecessors to Rokitansky, and in warm climates are more obvious than in cold.[3] To be brief, we will state that Casorati's explanation of specific agues, or as he chooses to call them, the diathetic intermittents, is based on the results of suppressed cutaneous secretion under sudden impressions of cold; assigning to this vitiated secretion the character of a rheumatic taint. We ima-

[1] In the old French practice, purgatives were very largely employed. The giant creatures of Rabelais' Chronicle die "*faute d'une purgation.*" In our student days in Paris Lisfranc was quite remarkable among the surgeons as giving an occasional dose of castor-oil. *Autres temps, autres mœurs.* In other respects, whatever our author expresses in his pages with regard to exclusiveness of causation and treatment of agues among the modern French, will equally serve for English practice. This, indeed, seems never to have advanced much beyond the clear and logically-expressed views of Senac, physician of Louis XV., to be found p. 184 et seq. in this volume, taken from his De Recond. Febrium, &c., Geneva, 1760. In his days, the mucous tract had not assumed importance, though intestinal distension or inflation was remarked upon, but the liver was the part by him supposed to be primarily irritated.

[2] For observations by Dr. Mantegazza on the variations in the frequency of the pulse and vital heat, see our number for Oct., 1862. Dr. Parkes has observed a certain periodicity both in health and disease, extending over three to five days in the amount of secretion of the solid ingredients of the urine. From such and other observations, vital function would appear to be wave-like. See also Paget's Lecture on the Chronometry of Life, delivered at the Royal Institution; an essay by Dr. Cowan, Trans. Med.-Surg. Association, vol. iv. Part iv.; also Prof. Henlé's Verlauf und Periodicität der Krankheiten, in his Pathologische Untersuchungen, &c. Berlin, 1839.

[3] In a warm climate, a glass of ice-water or lemonade often checks a diarrhœa which would be made worse by stimulants and absorbents. Scurvy in the Crimea, under stimulating treatment, rapidly assumed pyrexial forms.

gine, therefore, they should fall under the class of Rheumatalgia of M. de Savignac's arrangement. The essential phenomena of an intermittent paroxysm are constituted by a cerebro-spinal disturbance reflected upon the cardiaco-vascular system, in a general view, terminating according as they are relieved through processes of secretion. Such a paroxysm is supposed to result from any diathetic poison in the blood, organic or mineral,—rheumatic taint, miasm, pus, bile, mercury, variola; but the necessary condition is a localized organic irritation. As is well-known, an acute extensive phlogosis will be more or less certainly attended with a form of fever which is continued; but let a phlogosis be inconsiderable, let there be only an inflammatory disposition, or a mere source of irritation, in that case and under favour of climatic conditions, a more or less intermittent fever will be very likely to occur; and there is in this no divergence from recognised pathological laws, the difference is simply one of degree, the identity of continued and intermittent fevers is complete as regards their origin and essence. There is only that difference of so much more or less which does not change the nature of things.[1] For instance, Casorati has seen cases of cancer of the stomach and uterus, cases of chronic inflammation of the neck of the womb, subacute bronchitis, otitis, adenitis, inflammation and injury of the testis, spinal meningitis, colitis, perinæal and anal abscess, catheterism, tumours in the brain, mercury in the system, variola, tubercles in the lungs, psoas abscess, all according to his case book capable of producing regularly intermittent forms of fever, tertian as well as quotidian, benign or malignant;[2] oftentimes of the highest degree of malignancy, that is very generally fatal, whatever the treatment pursued. The urgent practical necessity that exists, in Italy especially, of diagnosing the symptomatic or spurious intermittents from those diathetic or specific intermittent fevers which arise from external causes, forms a great part of the subject matter of Casorati's book. The distinction between remittents which recover under cinchona, and those which are not benefited by it, is marked by the presence or permanency of the same organic primitive lesions as serve for diagnosis in the intermittent forms of fever.

In by far the greater number of diathetic intermittents or specific agues, the gastro-duodenal mucous membrane is said to constitute the point of departure of irritation and antagonistic revulsion. It becomes affected or involved under the same critical conservative laws of the economy, by which it has been found that poisons injected into the blood of animals under experiment tend to cast themselves upon the digestive tract; the presence of noxious agents in the blood or in any seat of the organism does not generate a morbid state except so far as the organs may suffer under their impression; if none of the

[1] See Sydenham's comparison of the duration of morbid conditions in quartan and continued fever, assigning 336 hours to each; Sydenham's Chapter on the Agues of 1661; also Dr. Christison's description of relapsing fever as a fever of seventeen days, with an interval of from seven to ten days in the middle of it; Address to British Association, 1863.

[2] Malignant, as used in these pages, is convertible with pernicious (perniciosa) of the Italians.

organs are changed in their action there is an absence of disease, for the vital economy is not disturbed.[1] In the instance we are considering, the suppressed and vitiated morbid secretion, or *rheum*,[2] is supposed to fall upon the stomach and to produce hyperæmia or irritation, which is not permanent but intermittent, or greatly remittent; now the tendency of all visceral irritation, as a result of antagonistic relations, is to relieve itself by the skin; if the immediate irritation is sufficient for the effect, such relief is preceded and facilitated by nervous and vascular disturbance in the organism, which, in a limited amount of time, thoroughly exhausts, discharges, or resolves the accumulated irritation, and partly by processes of secretion, partly through the chronometrical laws above enunciated, apyrexia ensues.[3] In other cases, it happens that the visceral congestion, or other morbid irritative condition, does not wholly intermit or terminate as the febrile action subsides.

In the second order of cases, even though there may be no painful sensation recognisable in the viscus, yet an inflammatory or sub-inflammatory condition may be there (for even in cancer of the stomach the pain is intermittent); but in every such case of continuing irritation the intermittent fever will partake in some degree of a symptomatic type, and in consequence will be no longer under the dominion of cinchona, but will require antiphlogistic means for its treatment.

Now although in 90 cases out of 100 specific intermittents, the seat of irritation is supposed to be in the stomach, yet other organs fall under the influence of the same diathetic cause, and then exhibit disturbances, which being most often of a feebler nature, are on that account very illogically termed masked agues; such are some hemicrania and other complaints, amenable to cinchona, all of the same type of disease.

Casorati makes very much of climatic differences; if, says he, in cold countries, where the blood is habitually collected about the internal organs, and their vascular activity thus increased, the blood is driven still farther from the surface, you are then likely to have acute inflammations,[4] pneumonia, and so on, with an accompanying fever

[1] In following these views, we shall perceive that nothing like independent febrile movement or essential fever is allowed for. It will be perceived how far this doctrine differs from that of recent humoral pathologists who regard the totality of the blood globules as forming an organ of cellular constitution identical, or nearly so, with the cell-producing organs which are spoken of as the solids. With them fever is a diffused phlogosis of the entire sanguiniferous system. It has been asserted that no remedy has as yet been found to act on morbid poisons so long as they continue latent in the frame. Dr. John Davy gives as the result of his post-mortem dissections in the Ionian islands, that it became a matter of surprise when he did not find organic changes in intermittent and remittent fevers, however the contrary might obtain in continued and yellow fevers. See Davy on Diseases of the Army.

[2] The word expresses an idea which is empirically intelligible, though not scientifically understood.

[3] In this first order of cases the irritation is intermittent, not alone the symptomatic febrile phenomena, but even the very essence of the disorder, in its fundamental organic seat. The cause of the renewal of the paroxysm is, as at first, the vitiated blood. As regards pain in the second class of cases, experience in true typhoïd teaches that pain bears no proportion to the lesion.

[4] These views may be looked upon as partly corroborated by what Dr. John Davy has observed in returns from Sierra Leone: Of 1843 white troops 739 died of remittent

which is continued ; such inflammations are consequent on an alteration of the vital movement; it is a *dynamic* effect implied in the vital action of the organs (motion being a condition of all life;) the nerves take a part in this effect; it is an antagonistic irritation or reaction. But in warm latitudes the distribution of the blood is quite different, it is very abundant on the surface of the frame, and the skin, as the principal emunctory is always very active; under such conditions of climate checked perspiration will lead commonly to intermittent fevers, to rheumatism, neuralgia, tetanus, chorea, dysentery; the cause here is rather *material* than *dynamic*, being referrible to a retained secretion which has undergone retrograde metamorphosis.[1]

Of a group of persons subjected to the influence of an identical cause—viz., exposure to night air, by lying down to sleep in fields when much fatigued and heated from the labour of irrigation, as practised during spring by night in Italy; two of their number were reported to have been attacked with intermittent fever, one with facial paralysis, one with arthritis, and one with sciatica.

The influence of humidity, indeed, resolves itself entirely into impressions of cold.[2] Miasm never operates unconjoined with humidity, and Casorati is of opinion that its noxious operation is wholly accessory. Miasm acts, however, with a most unmistakable toxic effect, principally in autumn season. It is a more heterogeneous and offensive poison than the rheumatic, and must be classed with other organic and mineral toxic agents. It may involve other organs in irritation, but, as Casorati teaches, it never fails to implicate the gastric mucous mem-

fever, only 1 of enteritis, not 1 of peritonitis or gastritis. In Ceylon, of 42,978 there died 995 of remittent fever, with only 3 cases of peritonitis, 7 of gastritis, 10 of enteritis.

[1] These abnormal results of the impressions of cold and damp in cold climates are mainly to be referred to lesion of vital movement, and depend on the antagonistic relations of the viscera to the periphery. Certainly the nerves are concerned; were they not so, we should be liable to become torpid under cold, like the lower animals. We may perceive herein our author wishes to liberate himself from the opinions of Broussais, who placed the sole proximate cause of ague in antagonistic visceral irritations consecutive to depressed vitality in the vessels and nerves of the skin; but Broussais' reasoning could not account for the return of the fit, which is the result of a material poison in the blood, potent in proportion to its amount and to its degree of vitiation. Thus we may understand how Casorati looked on Broussais as a vitalist.

[2] By contrast with other climates, as the Australian, not with our own, the Italian may be called moist—even the sirocco is loaded with moisture. In dry, sharp springs in Italy, especially with snow, there prevails little sickness, and that from acute phlegmasiæ, very amenable to treatment. In a moist, damp spring, on the contrary, all sorts of inflammatory conditions occur, both acute and masked, not so easily curable. Between the equinoxes, agues, gastric and remittent fevers, rheumatisms and diarrhœa, dysenteries, &c., are the rule. Impressions of cold from humidity are very severe. The cold of Romney marsh is notorious. In an instance of troops divided in barracks only by a small passage being affected with ague on one side, when those on the other side of the passage escaped, the affected troops are stated to have had their flooring over a tank. This reflection seemed to have escaped Dr. John Davy, who relates its occurrence in the island of Vido, which is quite free from suspicion of miasm. Dr. Marston, in vol. vii. of the Edinburgh Surg. Journal, 1861-62, has insisted on moisture as the efficient cause of ague, and instances a vessel freighted with wet deals, where all the crew suffered, and analogous cases from swabbed decks, &c.

brane primarily; and this organ appears to be the primary seat of irritation in the arthritic, dysenteric, pleuritic, and tetanic forms of "pernicious" fevers. The intensity of the miasmatic poison is the reason why intermittent and remittent fevers, and those for the most part of a severe character, are the only observed result of the operation of miasm, and that it is never followed by neuralgia and those other non-febrile rheumatic affections of the nerves, such as lumbago, sciatica, which frequently occur as the only result of the feebler operation of cold and humidity. It is to be observed, however, that, numerically, miasm enters as the cause of an extremely small proportion of intermittent fevers, and our author has observed that persons who are well clad expose themselves with a general impunity to its influence. He further adduces the fact that, according to his especial observation, peasants employed in threshing rice and maize by night in the barns, during the months of September and October, when the nights are at the coldest, and there is the greatest variation between night and day temperature, are far more subject to attacks of ague than those who work all day in proximity to the noxious rice-ponds, and who are occupied in miasmatic localities. It is known that a *pernicious* fever may ensue on the mere accidental stimulation of an organ, irrespective of intensity of diathetic or miasmatic poison, or even of bad visceral condition.

"With all this, it would be a great mistake to suppose that these very considerable and sudden affluxes of blood which precede functional disorder in the viscera are due to the greater virulence of the pathogenic cause; for there are pernicious intermittents, the origin of which is simply rheumatic, in which the visceral congestion and pernicious symptoms are evidently the effect of organic predisposition, and not at all of marsh miasma, which is nowhere present. An example will show this. Women with child are often the subjects of tertian fever. It happens very often, and especially when the paroxysm is considerable, as it generally is with them, that under the cold stage—that is, under the venous stasis occasioned in the viscera by the obstruction at the heart—these women experience uterine contractions, and either abort or are delivered. It generally follows that in such cases, at every subsequent paroxysm, the patient is seized with menorrhagia, which resists all treatment but such as aims at suppression of the fits—viz., by bark and quinine. I have also seen that, in girls suffering from diathetic intermittents at the time of menstruation, and notably in one case, in which life was nearly sacrificed, nothing was of any service in checking the hæmorrhage, which was excessive during the paroxysm, but the above-named remedies. . . . A strong country youth, of fourteen years of age, living on one of those pleasant hills on the further side of the Po, where miasm was out of the question, suffered from tertian in the beginning of June, 1848. This boy, as soon as the chills came on, chose to lie out in the full rays of the sun without cover to his head. Four paroxysms passed without unusual symptoms, but on the fifth he complained of cephalalgia, became taciturn, and afterwards decidedly comatose. Repeated applications of leeches, with quina given subsequently, operated a cure."

The necrological investigations of Maillot, in fatal intermittents,[1] undertaken in Algiers, in the performance of which the spinal cord was

[1] Traité de Fiêvres ou Irritations Cerebro-spinales Intermittentes. Paris, 1836.—The observations of this author were made in Ajaccio, Algiers, and Bona, all of which localities, and especially Bona, teem with the worst forms of remittent and intermittent fever.

examined with the other organs, left the impression on the mind of that pathologist that an alteration of the nervous system formed the fundamental lesion in intermittent fever. Casorati, after a searching analysis of these recorded facts, observes that sufficiently well characterized morbid appearances in the stomach constitute by far the most constant post-mortem appearance of all those observed:[1] only in one case out of twenty-four were they deficient; while the cerebral and spinal lesions found in head cases, which were mostly comatose and lethargic, were referrible to the more recent disturbances only, mostly indeed plainly to be referred to the last paroxysm, or being at least of ultimate character.

How much is it not a matter of experience that præcordial distress, anorexia, nausea, bad taste in the mouth, thirst, diarrhœa, exist in the very beginning of mild cases of ague, amounting in the more severe to vomiting and severe cardialgia, which even resembles the indications of corrosive poisoning. What experienced observer has missed this observation? As for such a theory as that of Bouilland—a theory which makes of intermittent fever a neurosis—who, as our author asks, has ever found anything in the semi-lunar ganglia[2] to warrant such an assumption? This is not reasoning, but a jump in the dark.[3] Of all the theories which our author stigmatizes, that in which the nervous system plays the chief part comes the worst off;[4] as to primary irritation starting from the liver, a nicer attention to facts would show that

[1] It may be stated that with hyperæmia of the stomach congestive lesions of the digestive tract, as well as of the encephalon, were coexistent in pretty nearly all the cases, the last, however, were far more rare in algid, syncopal, and cardialgic cases. In the very able and highly interesting Naval Medical Reports lately published by Dr. A. E. Mackay in the 'Edinburgh Medical Journal,' Dec. 1863, and Jan. 1864, this writer singularly enough refers dysentery to the very same external cause to which Casorati attributes specific agues—viz., to impressions of cold acting on a relaxed and perspiring skin. Refusing to acknowledge any identity between ague and dysentery, and regarding them as quite distinct diseases which never coalesce, though they may run side by side, Dr. Mackay's idea of ague seems not different from that most commonly received, attributing it to miasm. Dr. Mackay mentions that, in a voyage between Cape Horn and New Zealand, in a clean vessel and far from land, he has seen a cynanche followed by ague. If a boil, a debauch, a mere catarrh, or other small ailment be followed by intermittent fever, then, per force, miasm must have lain, *perdu*, in the constitution—in fact, must have made the voyage. We do not criticize these ideas, we merely state that such is not the interpretation Casorati would have given to the phenomena. Dr. Mackay's observations corroborate the statement that, according to his clinical experience, the stomach is the part that suffers first from miasmatic influence.

[2] Davy examined the great sympathetic nerve in his dissections made during ten years in the Ionian islands. In a few cases he believed that he had found traces of inflammation in the trunk-nerve, but the semilunar ganglia were white and normal.

[3] In the post-mortem appearances displayed during the Walcheren fever, according to Sir Gilbert Blane, some instances occurred of ulcerated as well as inflamed stomach, the ulcers having a sharp perpendicular edge, as if made with a punch. *Val. qu.* Blane supported the view that particular poisons were "specific stimuli" to the organs they affect: thus, in yellow fever, he reasons, the affection of the stomach and its morbid condition is, as regards the disease, the same as sore throat in scarlet fever. See Diseases of Seamen, p. 408.

[4] That the affection is chiefly nervous, says a transatlantic writer, may be *inferred*

this emunctory is affected only secondarily to the stomach and duodenum; in the sequelæ of the complaint, the liver and spleen undergo modifications which are anything but primary.

As a slight *à propos* of the foregoing pathological views, we shall quote a corroborating circumstance of apparently trivial character. Yearly when the cherries ripen in spring season, in Italy, vast numbers of children are attacked with intermittents, from over-indulgence in this fruit. The type is mostly tertian. Other more easily-digested fresh fruits may produce the like effect, but more often cause dysentery. Casorati says that the administration of purgatives is followed by the same form of fever. That miasm and humidity are anything like constant and exclusive causes of ague, will be very amply disproved by a wider consideration of facts. In the intermittent fevers of the Pyrenees,[1] Madrid, Pampeluna, and Greece, there is no suspicion of moisture or miasm, nor even in the cold, dry spring of Italy, in which currents of air are the frequent cause of tertians and double tertians. On the other hand, where damp comes into operation so as to produce the effects of chill, a very slight occasion will be sufficient, as feet wet from dew, (in forms mostly quotidian)—a moist shower or cold bathing, either of which is a common cause. The intermittents described by Frank, as occurring in Wilna in the month of February, require no other explanation than is found in the in-door atmosphere, from heated stoves, and the rarely-supervening sharp impressions of external cold on the Russians under such artificial hygienic conditions.[2] Casorati denies also that fevers which accompany inundations have any other cause than that of cold following the damp, at least until that season of the year ensues during which the influence of miasm is conjecturable. The celebrated inundation round Modena in 1690 took place in a year of quite exceptional coldness, as described by the celebrated Ramazzini, *pro vere hyemem et pro æstate ver sortiti fuimus.* In that year Modena stood as on an island in the flood; its city inhabitants were little affected, while scarce one of the country population escaped the effects of disease. Early in the year they were subject to simple tertians, none of which were fatal. Afterwards the interval grew shorter, and double tertians prevailed, many becoming "perni-

from its periodicity. Such false views lead naturally to the administration of large doses of Cayenne pepper by way of impressing the nervous system. Mental impressions are quite ignored and ridiculed by Casorati as means of cure. Mania he has never known as a secondary result of ague.

[1] Lebert noticed frequent agues in the region of the Alps at 6000 feet above the sea, where there is no marshy ground.

[2] In the Ionian islands, the mountainous districts of Zante are arid and free from vegetation, but agues are prevalent; so also in the islands of Meganiso and Vido, which are barren rocks; and Cerigo has no luxuriant foliage. St. Maura has Fort Alexandria, situated in the midst of a brackish lagoon, free from ague; another fort exposed to the sea-breezes, not far from it, uninhabitable from ague. In these Ionian islands the night air is dry; no dew falls. The difference between the wet and dry bulbs of the thermometer is as much as 12° to 20° Fah., varying with the land-winds; the evaporation therefore is very great, and consequently the liability to a chill. In Malta, the difference is as much as 30°, and there remittent fevers are the rule.—Dr. J. Davy. Op. cit.

cious" of every type, with head oppression, often fatal or bad continued fevers; no quartans, some cases of mumps, with many of diarrhœa and dysentery.

Febrile intermittents, when they become intensified and aggravated by bad treatment and *régime*, tend to pass into continued fever; but in immensely greater proportion is this the case with those of miasmatic admixture, especially of the lethargic and phrenetic type. Specific or diathetic agues, as already observed, may become symptomatic, especially the tertians and quartans; and symptomatic fevers have a tendency to become quotidian, and the more so in proportion as they are miasmatic in their origin. On the other hand, continued forms of fever pass into intermittent as they improve, and in like manner a-typic fevers become periodic. Casorati says there is no phlegmasia but offers example of this change of type in its accompanying fever; most of all, it occurs in those of the digestive tract. Now all authors, Sydenham, Baglivi, Maillot, are agreed that no remedy is so effectual in producing such change of type, from continued to remittent or intermittent, as bloodletting, with so-called antiphlogistics. Anything, on the other hand, which tends to irritate the stomach, such as purgatives, emetics, improper food, quinine, bark, opium, spices, induces a retrograde course from forms of quartan and tertian to double tertian and continued; many times with superadded stimulation of sensorial organs and aggravated visceral conditions, ending in nervous and putrid fevers, or inducing diarrhœa and dysentery, which often are fatal.[1] Among other converted forms of ague, Casorati incidentally mentions arthritis and endo-carditis. He even avers that he had seen typhus of an intermittent type; and the same character is to be met with in true plague[2] and small-pox. We must not omit to mention those cases called erratic ague, in which no true type of periodicity can be discovered:

"How often, in treating mild and pernicious intermittents, have we not had not only to supplement, but to precede the treatment with quinine by local and general bloodletting! How often in the dyspnœa, pulmonary congestion occurring in the tertians of gravid women, have we not had to use the lancet simultaneously with bark! In a case of summer tertian, with lengthy and severe paroxysms, but with intervals of fifteen to twenty hours, the patient, after having been several times purged and reduced by the perspirations she had suffered, had the fits cut short by quinine; but after three days' interval they re-appeared—i.e., as continued fever, with greatly increased headache, thirst, and agitation, epigastric anxiety, and bad taste in the mouth. In such cases, which are by no means uncommon, I have recourse to leeches on the pit of the stomach, with abstinence and cooling drinks. The results of this line of practice, according to my notes, are: in about one-fourth of the patients a prompt and lasting termination of the fever and all the gastro-cephalic

[1] The facility of conversion into continued is greatest in quotidian, less in tertian, still less in quartan fevers.

[2] As regards this feature in plague (see our preceding April number, p. 470); certain Irish fevers called typhus have also betrayed an intermittent type. In describing true typhoïd fever in Malta, see the last Army Medical Blue-book for 1861. Dr. Marston mentions cases in their pyrexial character resembling intermittents. It has been stated that old subjects of ague are prone to carry the intermittent type into the fever which may accompany subsequent ailments.

symptoms; in two other fourths, the reduction of the fever to its primitive intermittent type, and subsequent perfect cure by quinine; in the remaining cases, in spite of bloodletting, the fever did not cease, nor become intermittent, but remained continued. Such as ran their course assumed the forms and had the terminations which characterize acute gastro-enteritis. In a case of double tertian, with short intervals, and lethargy accompanying the stronger fits, blood was taken, the bowels opened, and quinine administered. The febrile paroxysms were cut short, but a degree of coma only less than that which had occurred in the paroxysms, remained. In such cases, I know no safer practice, or more expedient, to free the head from fulness and to remove coma, than abstraction of blood, both general and local."

Secondary seats of intermittent irritation occur equally from the premature use and a too long retarded employment of quinine, whether it occur from prejudice or happens from deficiency of the "divine remedy." Other cases, again, of ague, are solely amenable to antiphlogistic treatment, with or without bloodletting:

"In the spring of the year 1843, I imagined I had been successful with quinine in treating a case of malignant ague of phrenetic character (*perniciosa frenetica*). My patient was young, and of a robust constitution, but of irritable nerves, subject to gastric irritation and secondary headache of extraordinary severity. The cause of the ague in this case was clearly referrible to the influence of cold and damp at a time when the skin was heated and perspiring. He had already enjoyed five days of entire convalescence. On the morning of the sixth day, he took a soup containing badly boiled rice; very soon after, the soup was felt to sit uneasy on the stomach, and it was soon ejected by vomiting. In course of the evening he became fevered, without any preceding cold stage; and as night advanced, delirium of a furious character set in. He was then bled, and leeches were applied, under the idea that the paroxysm would terminate, and an opportunity be allowed of giving quinine. Such, however, was not the case. The type of the fever, as well as of the head symptoms, changed to continued. The patient, indeed, recovered, but not till after sixteen days of suffering, and only under very decided antiphlogistic treatment, comprising repeated bloodletting, both general and local, with perfect abstinence from food for ten days' time."[1]

We have no reason to suppose these bleedings to be of an insignificant amount, since in a case of ague with orchitis Casorati draws a pound of blood, and does not hesitate to repeat the proceeding. With all this, Casorati, in his mémoire on the positive anatomical relations of the visceral capillaries, and those of the periphery, shows a decided preference for local bleeding, especially in chronic affections.

An intermittent of bad type may be sometimes cured by a single bleeding. Casorati in this way cut short a pleuritic "perniciosa" in a gravid woman, one cephalic, two comatose cases, and one dysenteric, five "perniciose," each by one bloodletting. In the dysenteric alone, after two paroxysms had failed to appear, he had to use quina on account of some slight return.

The great success which follows on the practice of bleeding is due to the number of simple agues which become symptomatic. In

[1] The action of quinia and bitters has, by a modern eminent Scotch authority, been declared to be analogous to those of strychnine on the brain and nerves. Dr. Wood says: "It is in the brain that most evil is to be apprehended from the use of quinia, because it is on that organ that it acts most powerfully."—Wood's Prac. of Med. Philadelphia.

the "perniciose," the seat of primary irritation is nearly always in a state of inflammation, or at least, what has been termed *inflammatory disposition.* On inspection, the grey, red, and brown softening is discovered in the gastric mucous membrane, mostly of the left side, and injection and arborescence of the vessels, sometimes with dark sanguineous fluid in the viscus.

In the months of July, August, and September, and remarkably of late years in Italy, there are many double tertians; they often have that type from the very first. In winter time, and yet oftener in spring, individuals who have suffered from quartan fever in the preceding autumn, sometimes display the triplicate quartan, or else the double quartan; these always succeed to quartans of a simple type. The erratic is generally a symptomatic fever. Remittent fever, which in its nature and origin is identical with the intermittent, and only differs from it in its form, is frequent in proportion as the season is hot;[1] some of these begin in a remittent form, and some as intermittents: it is in this remittent form of fever that it is so urgent to form a correct diagnosis, an undertaking always attended with difficulty, and requiring a minute attention to symptoms; some remittents are of a rheumatic, some of miasmatico-rheumatic source and origin, and they are very liable to be confounded with fevers attendant on visceral lesions.

Thus, then, we believe ourselves to have indicated sufficiently how the system of Brown, so much followed in the author's early days, was prejudicial in converting tertian and mild forms into remittent and nervous continued fevers (varieties of acute gastro-enteritis), which were at that time mistaken for cases of extreme asthenia, only recoverable under stimuli. On the other hand, we have the authority of the greatest physicians—Sydenham, Torti, Baglivi, Grant, Broussais, Maillot—to show that some continued fevers and periodic and non-periodic remittents, under bleeding and low diet, become decidedly periodic and intermittent. Finally, we observe the fact, that among high feeders—persons whose stomachs are kept in an irritable state—the mild forms of ague scarce ever occur, but in their place gastric remittent fevers, requiring antiphlogistic treatment previous to their being treated by quina. In proportion as the stomach is irritable, that is, congested and continuously affected, so will an interval be short, and *vice versâ;* and also its morbid state may be considered to bear a well-marked proportion to the degree of relief afforded by the skin in previous paroxysms; so also does it bear a proportion to the malignancy of the external cause:

[1] The same is observable in ague districts in England. In the south of the island, in 1827, remittents equalled those of the tropics in violence and obstinacy. This has recurred in exceptional years since. In a certain proportion of these cases, leeching of the epigastrium, we are justified in saying, has become consecrated by the best class of local experience. This seems to be the case in our country, especially when two or more hot summers follow in succession, with a dry autumn. As recently as 1859, succeeding to the hot summer of 1857, the inhabitants of Romney Marsh suffered to an extraordinary extent; and at an early period of the century, after 1818, far more terribly. Some of these marshy districts, as the country round Sheerness, seem to favour the development of typhoïd and some of diphtheria.

still, in all calculations we must avoid the error of assuming the autocracy of the cause and passivity of the organism.

This appears to us to be a good opportunity for enlarging on those malignant forms of ague, called "perniciose" in Italy, which, though of identical nature with the milder forms, are now, one may say, unknown in our islands, though fevers of the same frightful intensity are described by Morton,[1] in his celebrated work, as having occurred here formerly. Casorati's experience extends to 68 well-observed cases. He divides them into two groups, the inflammatory and the asphyxio-adynamic: in all, without exception, he found present an indescribable epigastric oppression; dreadful apprehension; deep-drawn sighs, syncope, intense thirst, urgent or frequent vomiting, a sense of internal heat, with lowered temperature, extreme prostration, a more or less Hippocratic countenance, and with a failing, small, fugitive, and imperceptible pulse. Patients with "perniciose" have further this in common—that under the second stage of the paroxysm they fall into stupor, and in fatal cases they become lethargic for half an hour, one hour or two hours before death. Very singular are the contrasts observed in algid and choleraic forms in Algiers between the cold observed before death and the warmth subsequently developed in the corpse. Perhaps the most leading feature which attends "perniciose" is a strong spasm of the heart,[2] which just allows the thinnest current of blood to flow. The most frequent varieties are the cephalalgic, the comatose, the apoplectic, the cardialgic, the cardialgic emetic, the syncopal, the algid, choleraic, dysenteric, and diarrhœal. Other kinds are rare: in Casorati's experience of the epileptic and apoplectic with paralysis, he saw but one case of each; of the peri-pneumonic not many.

[1] The mention of them by Sydenham is far from obscure; perhaps the cause of such maladies may still exist, though improvements in clothing and shelter have rendered them inoperative in regard to pulmonic complications. We draw attention to the following: In the beginning of the present century two English militia regiments were encamped in Ireland, with a river separating them. Both were attacked by remittent fever, with obscure pulmonic symptoms. In one of these regiments, under a tonic plan of treatment, a frightful mortality ensued, and a commission was issued to investigate the circumstances. In the other regiment, under large bleedings, but two or three men died, and those incidentally. We had these details from the late Dr. West, a well-known successful practitioner at Blackheath, who was assistant-surgeon to the regiment (West Kent) in which the men were saved, and his immediate promotion was the consequence. The "nutan jwar," during the last few years prevalent in Lower Bengal, is a congestive remittent fever of aggravated type, the result of heat and miasmatic impurity. New in the memory of the inhabitants but not in the history of the country, it has carried off one-third of the population of the infected districts—in one of them 12,000 out of 18,000 souls. Rich and poor, young and old, even the embryo, are its victims. Commonly fatal in its first attacks, it clings with fatal persistence and constantly recurring accessions to the surviving sufferers.

[2] The possibility of spasm of the heart was denied by Laennec, but is strongly asserted by Casorati, as well as earlier writers. To this he refers the rigor. In many cases of algid perniciose the heart is found abnormally affected. Out of 9 such cases inspected by Maillot the heart was flaccid and discoloured in 6, and the left ventricle hypertrophied in 5. In such cases, too, the lungs are clogged with black blood and fibrinous coagula. The pathological views of American writers lead them to refer the spasm to the capillaries as a result of defective innervation. The early condition of the stomach would also appear, according to Casorati, to be that of spasm followed in subsequent stages by extreme distension and flaccidity.

Several forms mentioned by authors he has either not seen or explains away. The violence of these attacks depends upon the degree with which the stomach or organ primarily affected is implicated, and the length of time during which the irritation communicated to the cerebro-spinal system "abides there" until it is "reflected" to the heart. They may be purely diathetic, far oftener of miasmatic admixture, or at least of symptomatic character; and they certainly affect the rich and pampered rather than the under-fed classes.[1] In the cold stage there is a feeling of impending death; there are colliquative sweats, the blood collects around the internal viscera, the head, lungs, liver, and organs of digestion; *but the portal system is more clogged than the lungs;* the secretion of the internal organs is increased in this cold stage,[2] bronchial mucus is abundant, bile is vomited and even blood poured out; there is horrible gastralgia, or there may be cough, dysenteric flux, cephalalgic pains, delirium, convulsions, apoplexy, or asphyxia. This is a time of great danger, but perhaps even more so when the spasm of the heart gives way, and all the blood previously shut up in the venous system gets free range. This constitutes the commencement of the second stage; then large hæmorrhages freely occur. The course of the disorder is changed, and now the lancet may be required for the safety of the patient, to preserve him from the effects of its sudden convulsion: a burning fever has set in, the internal organs no longer secrete; finally, through the play, concert, or sympathy of the organs, derivation is effected on the skin, and in proportion as this organ acts freely, so is the patient relieved.

It is the experience of Casorati that in such cases as are so fortunate as to recover when bloodletting has been neglected, there remains a permanent disposition to headache, vertigo, muscular and mental debility, especially so in cases treated by quina alone, and also a decided liability to apoplexy. He reprehends the use of quinine at any time when the periodic type of the fever has not been ascertained; but in many cases bloodletting and quinine may be employed together.

As the first stage of a "*perniciosa*" consists in a spasm of the heart—a state in which the second sound is often wanting, the systole prevailing over the diastole, and sometimes both sounds replaced by a cardiac souffle—little good is to be expected by indulging the ardent thirst with warm or aromatic drinks, or even by the external application of warmth.[3] We shall notice a phenomenon described as occurring in the second stage, which is of great significance—namely, under a strong determi-

[1] This is contrary to what is asserted by American writers (see Wood's 'Practice of Medicine'). The difference of national habit as to drink may explain this. Still ague, according to their views, is attended with a cold state of stomach. We remember being told by a New York friend that he was cured of a refractory ague by the habit of carrying cloves in his waistcoat pocket, one of which he masticated occasionally.

[2] During the cold stage, secretion from the internal organs is increased; as regards the kidneys, this is verified by Dr. Parkes; also, as Sydenham very properly remarks, nearly always nature operates by the bowels, generally towards the end of the paroxysm—how he rails at those who, forsooth, would open obstructions by purges, and how glysters of milk and sugar formed part of his treatment, need scarcely be mentioned.

[3] Dr. Parkes has observed, by means of the thermometer, a gradual increase of vital heat in the first or cold stage of ague.

nation to the skin an eruption of urticaria[1] is not unfrequently manifested in great prominence. It usually evanesces with the decline of the paroxysm, but occasionally it remains longer as "purpura urticans:" other dermic congestions, either miliary or diffuse scarlet erythema, may sometimes be seen, but this one in multiplied and very considerable frequency: it is typical of the rheumatic or rheumatico-miasmatic fevers, both as regards intermittents and remittents. It often affects the mouth and fauces; the large irregular elevations are frequently intensely red, and leave ecchymoses on the breast and shoulders. Symptoms of angina may accompany the eruption, which disappears as the disease yields to quina. It is important to observe what an invaluable means of diagnosis is afforded in remittent fevers by the presence of this eruption; for, as it never makes its appearance in any cases of fever which are symptomatic of organic lesion, but is exclusively a feature of the rheumatic, rheumatico-miasmatic, and non-symptomatic cases, it is, when present, ever a sure guide to successful treatment.

Their connexion with our subject will not allow us to pass over in silence those results of diathetic poison which are known as masked agues or topical fevers (*febres topicæ*). Such external intermittent irritations, some of them accompanied with hyperæmia, are all of them in their origin and pathological significance identical with febrile intermittents; such are hemicrania, certain odontalgias, intermittent irritations of the spinal nerves, pleurodyniæ and anginæ, certain ophthalmias and inflammations of the ear, intermittent coryzas, cases of urticaria and arthritic forms. Erysipelas is disallowed by Casorati as a primitive irritation.

It was a conclusion established in the mind of Casorati that cinchona had been demonstrated to be the best treatment for acute rheumatism;[2] it was, indeed, a sort of fulcrum on which he based his argument. It results from his pathology that remittent fevers, when diathetic, are *gastro-enterite*, of rheumatic origin. This form of remittent, after preparatory treatment, is always amenable to quina, but such constitute but a minority of the remittents of Italy; in Naples and northern Africa, however, they form by far the greater part. The fever is generally typhoïd[3]—that is to say, asthenic; it often commences as an intermittent.

In an historical sketch of the treatment of ague, Casorati, while he does not omit to entitle cinchona a divine remedy, laments that since its introduction the treatment of the disorders has been far more

[1] An eruption of urticaria has by some been attributed to the action of quinine.

[2] We are inclined to the opinion that a much larger proportion of the "perniciose" of Italy are symptomatic than those of which we have account elsewhere. In Algiers, where the diathetic abound, under cinchona treatment Maillot lost but 1 in 5 cases. Dr. Wharton says that in the United States, under fair and opportune treatment, 1 death in 12 ruled; Dr. Parry, 1 in 8. Bailly, in the hospitals of Rome, out of 886 cases saved but 545, with 341 deaths. The result of treatment leads to the same conclusion. Maillot and the Americans rely wholly on quinine. In Algiers and Burmah, bleeding failed.

[3] The term "bilious typhoïd," which has been applied to some of these asthenic remittent fevers of the Mediterranean, can scarcely be maintained under the light of modern pathology. Dr. J. Davy, however, remarks on the tendency they display to glandular affection in the intestines, perforation in the situation of the glandulæ

empirical and devoid of a *rationale* than before: every one pretends to know a quinine fever, and how to treat it, whereas, in fact, the diagnosis is often perplexing; and in the management of ague, bark and quinine are often superfluous, nay, many times positively injurious; but the public are always carried away by striking results, and miasm and quinine form the alpha and omega of ague therapeutics. He dwells approvingly in the course of his remarks on Sydenham's division of ague into vernal and autumnal, but laments an error of practice into which false theories betrayed his successors. Fevers were at that time termed depurative and corruptive: the vernal were depurative, and were allowed very much to work their will; the autumnal were corruptive, and were tormented with emetics and purgatives, under the expectation of relieving the gastric oppression. In the present day in Italy, as elsewhere, the treatment of an intermittent is generally commenced by "clearing the bowels," and not unfrequently the purgative and quinine are prescribed in a single dose: the quinine dissolved in some compound rhubarb mixture, or with senna and purgative salt, and this mess will be repeated if the fit returns, and the quinine continued until the fourth or tenth paroxysm, often with the saddest results.[1]

"Is there a practitioner among us who every summer and autumn does not experience what I have to relate—viz., that numerous cases of tertian and quotidian, after undergoing for two or three days a treatment by purging and quinine, fall into continued fever, generally severe, often fatal. After suppression in the first instance of a fever of no great intensity by means of the treatment I have mentioned, they find themselves in a condition far worse than before; as witness the anorexia, dyspeptic symptoms, fulness of the hypochondria, constant general debility, fulness of the head, bad complexion, costiveness or the alternation of this with diarrhœa, œdema of the feet, &c., and on the most

agminatæ being not uncommon, as well as on the granular elevated patches which occur in the ileum, more frequently without but sometimes with ulceration of the villous coat, marked by no symptom of pain. Dr. Marston has subsequently described true typhoïd in Malta. Three of his cases had jaundice, which is extremely rare in typhoïd fever. In one of these the remittent form of fever led to the impression that the patient was suffering from a bilious remittent fever. Dr. Marston regards typhoïd fever as etiologically allied to other diseases, such as gastro-enteric ones, having a different or allied pathology. In Malta true typhoïd fever seems autumnal, and comes on with the first rains after dry summer heat. In that one of his works which brought to Casorati the chiefest praise—viz., his letters on the epidemic miliary fevers of the city and state of Pavia, of Lamellina, and Oltrepo, including the experience of twenty-five years—he describes many of these fevers with varioloïd eruption and perforation; but he was no friend to additions of "gastric," "bilious," borrowed from ancient medicine as it existed previously to Haller. Writing in 1847, he allows that nervous fever (query, typhus) might have its seat elsewhere than in the gastro-enteric tube, but the putrid (query, typhoïd) not. It is beyond a doubt that Casorati carried too far his prejudice in favour of abstinence in all fevers of continued type—a prejudice dissolved by Bretonneau and Graves.

[1] In Indian practice we see that quinine and tartar emetic are to be given in the same mixture. As for purgatives, the whole field of observation afforded by the conscientious records of physicians is absolutely obscured through their excessive employment with other strong remedies. Dr. J. Davy, in his final conclusions, confines himself to the recommendation of oleaginous purgatives. Mercury also has been much employed in British practice. Ramazzini, indeed, mentions a case of ague recovering during a mercurial course. According to Davy, it would appear to be most useful in those parts of the West Indies where agues are prevalent, as in Tobago and Guiana—

trifling cause return of the ague: or behold them attacked by acute, or more or less obscure visceral inflammation, with fever of a continued type; these unfortunates, after dragging a miserable weight of existence through summer and autumn in a degraded physical and moral condition, fighting against a series of relapses into tertians or quartans, all of them treated after the same fashion with febrifuges (cinchona and quinine), without attention to their visceral condition, without regulation of their diet, what can happen but that, as the cold weather arrives, they should fall victims to acute pneumoniæ or pleuro-pneumoniæ, with gastro-enteritis for a constant accompaniment? and such persons, if their condition of age or constitution is in the least way unfavourable, are pretty sure to die."

The diagnosis in intermittent fevers turns upon a single point: Is it a diathetic fever (i.e., rheumatic or rheumatico-miasmatic), or is it symptomatic—arising as a greater writer, Torti, expresses it, *a stabili vitio affectæ partis*—indicative of some internal lesion? If an intermittent fever come on after excess in food, anger, mental anxiety, or distress, it depends nearly always on congestion of the stomach, and should be treated by light diet or abstinence, and perhaps by loss of blood, but not by quinine; if, on the other hand, it follows on a chill, and there is no symptom of visceral engorgement, you will then have recourse to quinine; if you can refer the fever to miasm, not until full attention has been given to visceral complications, and not until you have removed them, will you have recourse to any preparation of bark. Invaluable are the means of diagnosis to be derived from observations on the order which the paroxysms and their intervals observe: the accessions of the diathetic are the most regular in the recurrence, and the erratic of course are the least so; of the periodic, the quotidians are more of them symptomatic of a fixed disorder than are the tertians and the quartans. The intermittent fevers attendant on cerebral and spinal meningitis, gastro-duodenal affections, subacute metritis, adenitis, and phthisis, are most frequently of a quotidian type. As a means of diagnosis, the hour of accession is in many cases suggestive. In diathetic spring agues the paroxysms come on in early morning; those of the summer season about midday; those of autumn towards evening or in the night: such agues as depart from this rule will, probably, depend on some abnormity in the frame, and will not be benefited by quina. If you find a spring ague coming on in the evening, it can hardly be diathetic; examine thoroughly, and you may make sure to find some weak point in the organism which is accountable for the fever.

We have already drawn attention to the little good which could be expected from warm or spiced drinks exhibited in the cold stage of the paroxysm; we have to add to it, that in the second, or hot stage, cooling drinks are to be allowed, the patient should be kept in his bed throughout the paroxysm, and during the sweating stage cold drinks and cold external applications should be most strictly forbidden.

As regards purgatives and emetics, we shall now use more preci-

least so where remittent fever, as at Barbadoes. Others, as Wood and Martin, value highly this remedy in the treatment of remittents. In the Peninsular war it proved inefficacious. The last accounts we received of Dr. Livingstone's "purgative specific" do not increase our confidence in that remedy.

sion concerning them. Of 50 cases of spring and summer ague, chiefly tertian, treated by Casorati, from 10 to 15 recovered under purgatives, or emeto-cathartic remedies; 3 to 4 got well without treatment; the remainder under bitters and cinchona preparations. In a similar series of cases in the latter days of summer and autumn season, not one case got well under purgatives and emetics.

"Indeed, under repeated doses of purgative medicine, many of the simple tertians were changed into double tertian, some of them into perniciosa, others into continued fever; in fact, precisely what Baglivi states as his experience in Rome: 'Ab adhibitis purgantibus febres intermittentes statim fieri continuas et si purgantia repetantur diuturnas et lethales.'"[1]

It is under these relapses that leeching of the epigastrium becomes such an invaluable resource. The result of these observations confirms those of other highly-esteemed physicians—namely, that purgatives (and even bleeding) are more successful in the treatment of spring agues than in those of summer and autumn.

But if with ordinary intermittents the diagnosis is a matter of importance, it is of the highest urgency in regard to the non-diathetic and symptomatic "perniciose." The nature of the latter was first accurately defined by Torti, a physician for whose directions Casorati expresses the highest amount of obligation. The diathetic, if not ill managed, may get well. The symptomatic are usually heralds of death; the first yield to cinchona, the latter are intensified by it. The diathetic "perniciose" generally occur in healthy subjects, and *vice versâ.* Symptoms of "perniciosa" seldom show themselves till after the second, third, or fourth fit of ague, never in the first; and yet there is a something to a watchful eye, a sort of miniature expression of the perniciosa, which may lead one to apprehend its accession: such are unusual somnolence, a passing loquacity during the hot stage, vomiting, with a liquid evacuation, rigor, uncommon epigastric distress from the first. These symptoms are a prelude to the perniciosa. The symptomatic "perniciose," as we have stated, are largely complicated with chronic disease. Cases are given at length, or merely mentioned, of abscess of the brain mistaken for ague; of chronic peritonitis and one of gastro-enteritis in the fourth or fifth week with all the symptoms of syncopal algid perniciosa; cancer of the stomach and cancer of the womb with syncopal cardialgic. Other cases are related where the primary irritation originated from gangrene of the arm, mortification from bedsores; in many of these the irritation is reflected primarily to the brain and nerves, and thence to the stomach and heart. In some of these cases it is evident that a diathetic poison other than the rheumatic and miasmatic, circulating in the blood, operates deleteriously on the chief vital organs, heart, lungs, brain, spinal cord, and stomach; such are suppurating phlebitis, cases of gangrene, and the open wounds of cancer.

Diathetic rheumatic "perniciose," for a large part of their career, are periodic fevers, and mostly tertian; even when they have become

[1] V. Baglivi op. om. Prax. Med., lib. ii. cap. x.

remittent, as after two or three fits often happens, they retain somewhat of that character until further modified by quinine. In the symptomatic "perniciose," most frequently the fever is neither intermittent or periodic, but if periodic, mostly quotidian. Urticaria never is seen but in diathetic cases; it comes on in the second stage, chiefly in choleraic perniciose, and in those called dysenteric, with foul, bloody evacuations; it never appears prior to the symptoms of asphyxia and algor, which denote that the spasm of the heart is intense. You meet with the diathetic perniciose in hot, moist, low regions, with malaria and contrasted day and night temperature, as in the autumnal equinox. The symptomatic are free from such connexion. A hint for diagnosis may also be borrowed from the hour of accession of the paroxysm: the diathetic are obedient to the seasonal laws we have already mentioned; the symptomatic very generally come on in some hour of the evening, but not always so when the stomach, as is perhaps the most common of all, is concerned; it is then the hour of dinner which regulates the accession, and this most often occurs in the night or towards day; in cases of softening or cancer of the stomach, the paroxysm is described as being always late at night or early in the morning.

Relapses from diathetic intermittent "perniciose" are nearly always into simple, mild intermittents; the same applies to remittent "perniciose." We do not here by remittents mean intermittent "perniciose," which having the double tertian type, approach closely to the character of remittents, but we mean true remittents, which have been so from the beginning, or have come to be so out of another type: such remittent "perniciose," then, when they relapse, resolve themselves into simple tertians. Now, with the symptomatic it is different; these change their symptoms—i.e., in the second or third paroxysm, algor or syncope may appear as a substitute for cardialgia; you may have coma instead of delirium, but not the periodic change: particular secondary structural alterations prevailing over the primary, operate their modifications. Let us close this portion of our subject by hinting that an individual originally diseased may possibly hold the rheumatico-miasmatic taint in his veins, in which case diagnosis would be very liable to trip, and the case be beyond measure complicated.

Although "perniciose" change their form of symptoms, and, although in cases which are rare, cardialgia, syncope, algor, and even asphyxia, may be accompanied by delirium and convulsions, yet the distinction between inflammatory and asphyxio-adynamic is generally maintained. Antiphlogistics and excitants will, therefore, be immediately required, without so much regard to the seat of primitive irritation, but according to the direction in which the secondary sympathetic or co-sensual disturbance is reflected. As regards inflammatory head-symptoms, we have already mentioned that Casorati meets them with bleeding. There remain for our notice the leading symptoms of each form of "perniciosa;" the most frequent is that accompanied by sopor.

"There are various degrees of sopor; sometimes it does not go beyond mere somnolence, from which the patient is easily roused. He will answer correctly and pretty quickly to questions addressed to him, and then go off to sleep again. Or, again, sopor may be deeper in character; the answer may not be incorrect, but delayed, incomplete, the words ill-articulated; the eyelids borne down with a heavy weight, the eye fixed in vacancy; the patient forgets from one moment to the other what is said to him, and the sensations of the most urgent nature, as, for example, thirst, desire to pass urine and fæces, are disregarded. In other cases, the sopor is decidedly lethargic in character; intelligence is quite gone; there is insensibility to every kind of stimulus, even to that of fire; and the respiration, as in apoplexy, is noisy and stertorous. Dysphagia, grinding of the teeth, hiccough, generally accompany these grades of sopor. Those varying degrees which sopor may progressively attain in successive paroxysms, I have occasionally met with in a single paroxysm, with manifest peril to the patient. From such differences of degree in the symptom has the name been applied to *perniciose*, in which it forms the principal feature of comatose, of lethargic, carotid, apoplectic perniciosa. The form of perniciosa which we are now considering is the most frequent of all. Sometimes sopor succeeds delirium, but never does delirium succeed to sopor.

"As cephalalgia is a symptom of ordinary intermittents, it is not diagnostic of perniciosa unless it amounts to a certain amount of intensity. In the perniciosa the patient shrieks outright, he screams with pain, his eyes flash, they threaten, he rages in delirium, or falls in convulsive throes. But delirium often ensues without this bad cephalalgia; in youthful subjects, fulness and redness of the countenance, heat of the head and throbbing temples, and often epistaxis, precede a delirium. In them it is often shown in singing, or in attempts to escape, or to throw themselves from the window. In the aged, delirium is of a mitigated character, shown in unintelligible mutterings, alternating with coma. In nervous patients, it displays itself in particular hallucinations. . . . . . In dealing with youthful subjects of robust constitution I never hesitate to bleed, but under opposite conditions I give the preference to leeches. In such a case, the seat of application is by no means an indifferent circumstance. For this, the seat of the primary visceral irritation, the epigastrium, should be preferred. The rapidity with which, after the first application of the leeches during the existence of the paroxysm, the sopor, delirium, and convulsions disappear, is something marvellous. Still, as the above symptoms, especially when strongly pronounced, always indicate a high degree of irritation and sanguineous congestion of the cephalo-spinal organs, often generally attributable to the sympathetic irritation from the stomach, and more often still to a depraved condition of the central organs of innervation, and to resulting sensorial and physical stimulation of the same, I cannot but approve the practice of those who under such circumstances take blood, not only from the capillaries of the epigastrium, but also from the capillaries which supply the head and neck."

In the review of such phenomena the work closes; in fact, a very large part of the treatment and management of the intermittent "perniciose," as well as that of the remittent, remained to be considered; a chapter on the treatment of relapses, and the author's views on the action of cinchona, being wholly wanting, though indicated by his pen.

It is with deep regret that, in finishing our account of the labours of this able physician, we ponder over that part of the subject which he has left unconcluded. We have often reflected during the perusal of this fragment, which, like some fine statue unfinished in the face or feet, or with some yet unshaped limb, yet shows vigour, power, and proportion, on whatever side we examine it—how considerable is the difference between those who work from the life and those who copy at second hand. Most sincerely do we hope that some one of the more able of the disciples of so popular a teacher may be able to complete the work, which with so great a propriety has for the present been scrupulously preserved.

REVIEW IV.

On the Influence of Mechanical and Physiological Rest in the Treatment of Accidents and Surgical Diseases, and the Diagnostic Value of Pain. By JOHN HILTON, F.R.S., F.R.C.S., Member of the Council of the Royal College of Surgeons of England, late Professor of Anatomy and Surgery to the College, Surgeon to and Lecturer on Surgery at Guy's Hospital, Examiner in Surgery at the University of London, &c. &c.—*London*, 1863. 8vo. pp. 499.

THE volume before us consists of lectures which were delivered at the Royal College of Surgeons during the years 1860, 1861, and 1862, while Mr. Hilton held the office of Professor of Anatomy and Surgery to that body.

The subject he has chosen is an attractive one. We have all, both professional and lay, had some personal experience of pain, and of the relief afforded by rest; and we feel sure that when an able man of long experience undertakes to treat these subjects in their relation to health and disease, we shall be furnished with a book full of interest and instruction.

If we approach Mr. Hilton's lectures with such expectations as these, we shall not be disappointed. We shall find that an attractive subject is handled in a way which sustains our interest throughout, that it is illustrated by some original observations in anatomy and pathology, and that the plan of treatment which he advocates is enforced by a series of striking cases which have occurred in his practice.

"Pain is a fact. Rest is a reality. To study the interpretation of the one, and the due application of the other, is to pursue the simplest and most obvious phenomena presented by nature, to the wide and comprehensive laws on which they depend, and by which they are regulated." (p. 488.)

"From the pain of the conjunctiva on the intrusion of a particle of dust, and the closure of the eyelid for the security of rest, up to the most formidable diseases we have to treat—pain the monitor, and rest the cure, are starting-points for contemplation, which should ever be present to the mind of the surgeon in reference to his treatment." (p. 489.)

Perhaps medical men have not given sufficient importance to rest as an agent in the cure of disease. They have been inclined to trust too much to their own endeavours, and too little to the "*vis medicatrix naturæ.*" They have tried to meet disease directly, instead of being content to put what we call Nature in the most favourable position for exerting her own restorative power. It is but seldom, comparatively speaking, that we engage in a hand-to-hand contest with disease. We do so when we meet a poison, by its antidote, or when we apply a specific remedy; but in other cases, all that we can do is to support Nature while she carries on the battle and drives out the foe. This is the point which Mr. Hilton endeavours to inculcate—that in many cases the duty of the surgeon is merely to afford rest, and he indicates the true principles on which this rest is to be given. Sometimes it is "mechanical rest" that is wanted, and sometimes it is "physiological." At one time it is the application of a splint, at another it is the division of a tendon. To determine in each case what is required, we must ascertain the disturbing cause. We must make an accurate diagnosis; and in order to do this, we must refer to the anatomy and physiology of the parts concerned, more particularly to the distribution and connexions of the nerves. It is here that our author seems to excel. He is no mere "mechanical surgeon." On the contrary, in his hands the science of surgery holds a much more conspicuous place than the art. A thorough knowledge of anatomy and physiology is brought to bear on each case; as far as possible every symptom is investigated, every lesion traced to its origin, and then the remedy is applied. Of course, in the cases here quoted, that remedy is generally *rest*—rest of such a kind and under such conditions as shall secure to the diseased parts the most perfect repose, in order that Nature may restore them to health.

The lectures open with some general observations on "the therapeutic influence of rest, and on the means taken by Nature to secure repose for the various parts of the body.

"Activity and rest, alternating, and in due relation to each other, form the physiological basis of, and the key to, health in man, and, perhaps, in all living organs. All viscera . . . . require the alternate condition of activity and rest to keep them vigorous and in health. If this condition be not observed or attended to, structural changes and deterioration of vital endowment or function are sure to happen to them." (p. 11.)

"How different is the effect of rest upon any machinery invented or constructed by man! How utterly abandoned is the expectation or hope of man's ever contriving any machinery that shall have the power to repair its own waste of structure, or to renovate, by its own inherent capability, any defect in its combination. However exquisite and perfect it may appear to be, its 'wear and tear' is simultaneous with its mechanical activity. Rest even exaggerates its imperfections, and induces decay. Its necessary renewal is the substitution, by other hands, of a new and like material." (p. 12.)

Our author then addresses himself more particularly to his subject, and begins by considering some diseases and injuries of the brain and spinal cord, and the benefit they receive from treatment by rest. In doing so he draws attention to some points in the anatomy of the brain and its coverings, and dwells on the part which the cerebrospinal fluid bears in compressing the nervous centres, and restoring them to a state of quiet after the turgescence of functional activity. In this respect he compares the fluid to the elastic capsule of the liver and other organs which are liable to considerable variation in size.

The subject of diseases of the spine affords the lecturer some striking illustrations of the principles he advocates. Several cases are related of that most formidable malady, disease of the odontoïd process; and in some instances the patients were restored, if not to perfect health, at any rate to a state of comparative safety and comfort, by the judicious employment of rest.

We are next invited to consider the application of rest to some of the diseases of the soft tissues, as abscesses, sinuses, and ulcers; and our attention is particularly drawn to the plan of opening deep-seated abscesses by making an incision through the skin, and then introducing a grooved director, upon which a pair of dressing forceps can be passed, in order to dilate the opening and evacuate the matter. This method has long been practised and taught by Mr. Hilton, and he now publicly recommends it to the profession on account of its simplicity and safety. The instruments required are always at hand, and the patient runs no risk; whereas we fear it must be confessed that lives have been sacrificed by too free a use of the knife in these cases—an accident which could hardly occur if surgeons would adopt the practice we have just described.

In speaking of sinuses, Mr. Hilton points out how a knowledge of anatomy may often enable us, by the division of a tendon or by other means, to give the parts the rest they require, without "laying the sinus freely open and allowing it to heal from the bottom," or any such severe measure. "Surface coaptation, equivalent to rest, then quickly takes place, and the abscess, instead of being tedious, is brought by 'rest' to a rather speedy termination." (p. 115.)

The chapter which treats of painful and irritable ulcers affords a remarkable example of our author's sagacity and careful investigation. He has observed that the exquisite pain and irritability may generally be traced to one particular spot. On removing this part of the ulcer the pain ceases and the case progresses rapidly. If the excised portion be examined with the microscope, it may often be found to contain exposed and denuded filaments of nerves. Thus, then, under Mr. Hilton's guidance, we seem to have arrived at something like the true pathology and treatment of these cases, which are always very distressing to the patient, and often extremely troublesome to the surgeon.

But perhaps the most interesting part of the volume before us is that which is occupied with the consideration of the diseases of joints. These diseases are so frequent, so urgent, and apt to give rise to such serious consequences, that they must always be a subject of the greatest interest to surgeons. But of late years this interest has been heightened by the attention which has been called to the relative value of excision and amputation in those extreme cases which require an operation. The merits of these two operative measures have been discussed in the pages of this Review from time to time, as opportunity offered; and now we have the benefit of Mr. Hilton's views on the subject, and on "rest" as a curative agent in the treatment of these formidable maladies. He prepares the way by some observations in anatomy, showing that—

"*The same trunks of nerves whose branches supply the groups of muscles moving a joint, furnish also a distribution of nerves to the skin over the insertions of the same muscles; and—what at this moment more especially merits our attention—the interior of the joint receives its nerves from the same source.*"

After unfolding and illustrating this proposition, he points out what are the first and most trustworthy symptoms of joint-disease, and then mentions the excellent results obtained from "rest," judiciously applied, in the early stages of these complaints. But he does not confine his remarks to the *early stages* of the disease. Far from it; he advocates treatment by rest in all stages, and gives examples which show that he has not over-estimated its value. The following case may be interesting to our readers. We give it, as nearly as possible, in Mr. Hilton's own words:

Case.—A boy was admitted into Guy's Hospital in October, 1856. "He had already been in a London hospital between three and four months, and had left it six months before I saw him. The surgeon under whose care he was, judging from the boy's appearance, and from the suppuration taking place in the joint, the general tendency to displacement, and the constitutional disturbance from which he was suffering, the indications of perhaps a rapid death, proposed to the patient that the leg should be removed or the joint excised. The boy was only 11 years old, so that he had not much voice in the matter; and the father and mother, when consulted, would not accede to the recommendation. The patient was therefore removed from the hospital. In Oct. 1856 he came under my care. At that time the joint was very much flexed, there was a good deal of swelling, suppuration had occurred, and abscesses were discharging pus freely. The leg was rather more than semi-flexed; the pain in the joint was not very severe, except when moved or pressed; and the amount of discharge was somewhat diminished. The whole of the joint and surrounding structures were much swollen from infiltration with serum and lymph. Seeing the boy in this condition, and having observed several others in a like state, I felt that I might trust to previous experience. Instead, therefore, of proposing amputation or excision, I resolved to divide the tendons of the flexors, which were disturbing the joint. . . . I divided the tendons of the biceps muscle, the gracilis, semi-tendinosus, and the semi-membranosus. The latter were all divided in the popliteal region, close to their point of turning towards the inner side of the head of the tibia, and the biceps tendon was severed about one inch above its insertion upon the head of the fibula, taking care, of course, to avoid the peroneal nerve. The limb was then put upon a straight wooden splint, and remained so during eight months. By the aid of simple strapping and pressure, the joint soon became free from pain. At this time the leg was nearly straight, and the patient was almost free from all constitutional disturbance, the discharge being exceedingly small. . . . I need not trouble you with the further details of this case. During the last year and a half the boy has not used a stick or crutch; he has had no pain, he can walk three or four miles without difficulty, and is occupied the whole of the day in business. On examining him lately, I found the patella affixed to the femur, but there is a slight degree of motion between the tibia and the femur. I think this is a good case for showing the value of giving rest to a joint, for that is all I did. I did nothing more than any other surgeon could have done. I simply divided the tendons, which were the disturbing cause, and then we had no further difficulty in keeping the articular surfaces in coaptation." (p. 224.)

Here, then, we have an excellent example of the "bloodless conservative surgery" which Mr. Hilton advocates, a case of the most severe kind, cured by division of tendons, extension, and rest; and the patient, probably, placed in a better position than he could have been by any capital operation, however successful. It is true the recovery took many months, and there is often difficulty in keeping patients in hospital more than a quarter or half a year; but this objection does not apply to private practice, and, so far as it applies to hospital practice, it is sufficiently met by pointing out that the recovery after excision of the knee is sometimes very protracted. We have known a case in hospital more than a year after operation. But the strongest argument in favour of the practice which Mr. Hilton adopts is this—that if the principles he advocates became generally known, and if joint-disease was diagnosed in its early stage, and judiciously treated by rest, the cases calling for operative interference of any kind would be extremely rare. It must not be supposed, from anything we have said, that our author condemns the use of amputation or excision in these cases. He expresses no such opinion. On the contrary, he would, we imagine, readily admit that there will always be cases in which one or other of these proceedings would be required; but at the same time it is clearly his opinion that many patients have been submitted to severe and hazardous operations who might have recovered, slowly it is true, but surely and safely, under the application of such measures as he recommends. The lectures which relate to this part of the subject we cannot too highly commend to the attention of all practical surgeons. They include the diseases of almost all the important joints of the body, and go far to prove that at least in private practice—where time is no great object, and every appliance can be obtained—the cases which require an operation, at least in instances, are few indeed.

As regards the vexed question of opening abscesses connected with joints, Mr. Hilton endorses the opinion which is now pretty generally received among surgeons, and which Sir Astley Cooper expressed many years ago:

"With respect to the treatment of abscesses, it is right in all diseases of joints, and especially in diseases of the hip-joint, to postpone the opening of them as long as you can; unless the abscess is exceedingly large, it is best not to open it at all. The reason of this is, that if you open the abscess early you expose the cavity of the joint to irritation; whereas, if you delay the opening of it, you suffer the abscess to make its passage to a considerable distance from the joint, so that the opening of it will not be liable to excite much irritation in the cavity of the joint. The irritation will be very slight if you delay the opening; but if you make it early, the effect will be just the same as if you were to make an incision into the joint. Give time for nature to perform her task, and to fill the joint itself with adhesive matter, as the abscess extends down the limb to a great distance from the joint. I have made up my mind most decidedly on this point, having again and again had an opportunity of contrasting both modes of practice."[1]

We have now referred to some of the most important subjects

1 Sir Astley Cooper's Lectures, lxviii.

treated of in the volume before us; but we must leave it to the reader to discover for himself the many interesting points in anatomy and surgery which it contains. For ourselves, we can say that the perusal has afforded us much pleasure and much instruction. We trust these lectures will be largely studied, and that the principles they inculcate will make a deep impression on the minds of medical men.

As Mr. Hilton apologizes in his preface for the "unstudied style" in which his lectures are written, it would not be fair to criticize it severely. We may, however, be allowed to say, that when another edition is called for, we hope the text will be "thoroughly revised and remodelled," for as it stands at present it hardly does justice to the subject-matter.

One word more, and that is about the illustrations. Of these some are good, some are passable, and some are positively bad. For an example of the last class, see p. 163. On the whole they are inferior to those which are found in professional works of the present day, and exhibit but little of the progress which the art of wood-cutting has made during the last few years.

Review V.

Om Osteomyelitis Diffusa (*Chassaignac*). Afhandling for den Medicinske Doctorgrad. Af C. Studsgaard, Reservechirurg ved det Kgl. Frederiks Hospital.—*Kjöbenhavn*, 1863. 8vo. pp. 149.

On the Diffuse Osteomyelitis of Chassaignac. A Thesis for the Degree of Doctor of Medicine. By C. Studsgaard, Surgeon-Extraordinary to the Royal Frederiks Hospital.—*Copenhagen.*

Diffuse myelitis, arising either spontaneously or in consequence of indirect violence affecting the contents of the medullary canal in the long cylindrical bones, has during the last decennial period been the subject of more accurate observation than formerly, and will soon be assigned an independent place in nosology beside periostitis, osteitis, &c., inasmuch as it exhibits itself as a disease presenting characters differing decidedly from those of other affections of the bones. The author enters upon a review of the various theories which have been brought forward in explanation of its nature, and as he has himself observed a considerable number of cases of the kind, he is able to base his criticisms upon his own clinical experience.

Duverney, in 1700, recorded a couple of cases of longitudinal fractures, or fissures, in a long bone, which Nélaton[1] briefly quotes as examples of inflammation of the medulla, and which Malgaigne[2] details more fully; but only in one case was the existence of a circumscribed medullary abscess established; in the other, where the fissure was not even near the medullary canal, the symptoms were

[1] Elémens de Pathologie Chirurgicale. Paris, 1844, t. i. p. 595.
[2] Traité des Fractures. Paris, 1847, t. i. p. 39.

removed the day after their first occurrence by an incision, and it has, moreover, since been satisfactorily established, that the result of such lesions is so different from the disease which forms the subject of Dr. Studsgaard's essay, that the two cannot be confounded. Nor has Jean-Louis-Petits'[1] theory been established, that exostoses projecting into the medullary canal may, by pressure, produce myelitis.

Trojas' investigations first laid the foundation of a scientific appreciation of the relation of the medulla to the bone. His experiments on animals proved, in the following manner, the indispensableness of the medulla to the bone: after having amputated a leg, he destroyed the marrow in the diaphysis of the remaining portion with a pointed instrument;[2] whereupon necrosis followed in the bone so far as the medulla was destroyed, with corresponding detachment of the periosteum, which, together with the regenerative new formation from the inner surface of the periosteum, he accurately described.

These experiments were subsequently repeated by Koeler with the same result, and by Cruveilhier,[3] who, by destroying the marrow through a perforation in the bone without previous amputation, succeeded in studying the course of the necrosis, from the formation of the sequestrum to its elimination through cloacæ in the newly-formed bone. Cruveilhier mentions at the same time, that he has often found pus in the medullary canal in patients who died after amputation, and he connects therewith the co-existing pyæmia, assuming that it has proceeded from inflammation of the veins of the bone.

These investigations were followed by the observations of Ribes,[4] Reynaud,[5] Miescher,[6] Porter,[7] Boyer,[8] and Stanley.[9] It was by the last-named writer that diffuse osteomyelitis was first more fully described, and his name deserves to be placed at the head of those modern authors who have treated of the subject.

"Inflammation of the medullary membrane," he observes, p. 18, "is followed by inflammation in the periosteum and outside of the bone. Moderate inflammation of the medullary membrane is followed by thickening of the periosteum, and by osseous deposits on the surface of the bone, with expansion and thickening of its outer lamella. Acute inflammation of the medullary membrane is followed by ulceration of the periosteum, by suppuration beneath it, and by ulceration of the surface of the bone."

In another place, p. 34, he says:

"Diffuse suppuration, through the cancellous and medullary tissue of a bone, is usually a most formidable disease, leading to destruction of the bone and of the soft parts around it, with the most severe constitutional derangement."

1 Traité des Maladies des Os. Paris, 1741.
2 Experimenta circa Regenerationem Ossium Novorum. Paris, 1775.
3 Anatomie Pathologique. Paris, 1816.
4 Art. Nécrose in the Dictionnaire des Sciences Médicales. Paris, 1819.
5 Archives Générales de Médecine. Paris, 1831, t. xxvi.
6 De Inflammatione Ossium. Berlin, 1836.
7 Pathological Conditions of Bone. Todd's Cyclopædia. London, 1836.
8 Traité des Maladies Chirurgicales. Paris, 1845.
9 Treatise on Diseases of the Bones. London, 1849.

Gerdy[1] treated of the same subject under the name of Medullitis, but neither he nor any of the later writers seem to have been acquainted with Stanley's work; one of them, Demme, certainly mentions Stanley's name, but he has probably quoted him at second hand, as he classes him with a number of other authors, who appear to have studied inflammation in the medullary canal exclusively after complicated fractures and amputations.

Gerdy describes medullitis after amputation much as Reynaud does, while, so far as we can judge from his symptomatology, he has himself scarcely observed diffuse acute inflammation without direct lesion.

The question thus remained undecided and open; Cruveilhier's and Reynaud's theory of phlebitis, which was confirmed by the English writers, Phillips and Carswell, we shall subsequently find applied also to the cases which are not directly traumatic, just as Stanley's observation of the separation of the epiphysis was soon confirmed, and was by some adduced as one of the most essential elements in the disease. Attention had been, on the whole, excited and directed to this affection, when Chassaignac,[2] in 1853, published the results of his experience on the subject. The merit of his 'Mémoire sur l'Ostéo-myélite' beyond the works which preceded it, lies in the clearness with which he describes the disease as a unity with a peculiar recognisable stamp and course. Stanley, who of the earlier writers was nearest the truth, has not adequately distinguished it from the allied diseases of the bones.

Inseparably connected with the acute sub-periosteal abscess and the deep, diffuse, suppurating phlegmon, osteomyelitis, according to Chassaignac, presents itself with typhoïd symptoms, which led him to call it "typhus extremitatum." To this name the author objects; and he is of opinion that if a typhoïd fever was really present in Chassaignac's patients, which from the published reports of the cases he doubts, it was a merely accidental complication, having no necessary relation to the disease.

Through suppurative arthritis by perforation from the medullary canal, first of the cartilage between the diaphysis and the epiphysis, and afterwards of the articular surface and articular cartilage, the inflammation is transmitted further as the capsule is perforated; while the bone itself, which in the commencement exhibits signs of osteitis, soon dies, as both internally and externally it is cut off from nourishment, and is bathed in pus. The propagation of the inflammation takes place generally in an ascending direction, and many long bones may be attacked simultaneously, usually on the same side of the body. This multiple occurrence of osteomyelitis was described first by Chassaignac. Separation of the epiphysis and regeneration of the bone he did not meet with. He does not treat of circumscribed myelitis, nor of the inflammation which follows direct lesion of the medulla; and he takes no notice of his predecessors except that, in a single place, he mentions Reynaud's with Howship's, and a few

[1] Archives Générales, Août, 1853. De la Périostite et de la Médullite.

[2] Gazette Médicale, August 19, 1854, and following numbers.

other English writers' names; but he interprets the type and indications of the disease exclusively according to his own scanty experience.

Withusen[1] doubts that perforation of the articular cartilage happens as constantly as Chassaignac states. In treating of necrosis, he mentions the traumatic form produced by a fall upon the feet; rather than assume the presence of osteomyelitis, after concussion of the medulla, he would ascribe it to the pressure which the bone suffers in the fall.

Klose,[2] basing his observations upon a greater number of cases, thirteen—which it is to be regretted that he does not report—produced, in 1858, a detailed, but one-sided description of the disease, which, after a frequently concomitant symptom, he called separation of the epiphyses, a lesion of development. In consequence of meningo-osteo-phlebitis with suppuration in the medullary canal, after rheumatism or concussion of the medulla by indirect injury, the bone dies, while an ichorous suppurative periostitis and deep-seated phlegmon are simultaneously developed. Separation occurs between the epiphysis and the diaphysis, whose necrosed extremity may perforate the soft parts, the inflammation extends further by suppuration in the connective tissue, the capsule is destroyed, and finally, the patient dies pyæmic.

Apparently without being acquainted with Klose's article, Professor Buntzen[3] treated of the same subject also in 1858, under the name of "the traumatic (primary, acute) necrosis or osteomyelitis of Chassaignac." He has had under his observation exclusively traumatic cases, in which the medulla was not directly injured; and he is inclined to assume the existence of necrosis arising after a concussion of the bone, as the cause of the suppuration in the medulla and under the periosteum.

Among the writers generally quoted as having treated of osteomyelitis, is Gosselin,[4] who in a memoir, 'Sur les Ostéites épiphysaires des Adolescents,' states decidedly that the disease has its seat in the parts of the bone adjoining the cartilage between the epiphysis and the diaphysis. It cannot, however, be said that he has advanced our knowledge of the subject, as he confounds inflammation in the neighbourhood of the extremities of the long bones with osteomyelitis, which differs totally from it.

Frank[5] keeps somewhat nearer to Chassaignac's original view, notwithstanding that he retains the name: separation of the epiphyses with the prefix of "the inflammatory." He defines the disease as a peculiar kind of necrosis, which follows inflammation of the inter-articular cartilage, and adds, that the starting-point in some cases may be

[1] Hvilken Betydning har Beenbetændelsen for den chirurgiske Pathologie' Kjöbenhavn, 1854. (On the bearing of Osteitis upon Surgical Pathology.)

[2] Vierteljahrschrift für die praktische Heilkunde. Jahrgang 15, Bd. i.

[3] Hospitalstidende. Kjöbenhavn, Sept., 1858.

[4] Archives Générales. Paris, November, 1858.

[5] Ueber entzündliche Epiphysenlösung. (Inaugural Dissertation.) Giessen, 1861.

osteomyelitis, or periostitis. So far we here see an attempt to reconcile the different theories, as he combines a little of each person's view with his own; in this, however, he succeeds only exceptionally, and while Gosselin has given a good description of a type of disease, but has failed in his reasoning upon, and appreciation of the same, Frank is not accurate in either respect; moreover, he adduces the number of bones attacked in the same individual as a proof that constitutional causes, as scrofula, predispose to the disease, which may arise also after injuries, over-exertion, or exposure to cold, and occurs always before the twenty-fifth year; that is, before ossification between the epiphysis and diaphysis is complete.

Fischer[1] devotes a chapter to separations of the epiphyses, which he divides into those following an inflammation, and into the traumatic. The former are met with, either as a symptom of osteomyelitis,[2] or as the result of a primary inflammatory affection of the substance between, and even of the adjoining parts of, the epiphysis and diaphysis—Gosselin's "osteitis epiphysaria suppurativa acuta"—which may occur in the single or multiple form, and may extend to the veins in the medullary canal, the bones, the periosteum, and the joint;[3] or the epiphysis may be separated by a periostitis in the neighbourhood without its being possible to establish absolutely certain diagnostic marks between the last two species, because suppurative periostitis necessarily attends them both when the separation is about to occur, or has already taken place, and the symptoms do not differ in any essential respect. A fourth variety of separation of the epiphysis, as the result of inflammation, he has not mentioned—namely, that which is secondary to a disease of the joint. The fact, that Bonnet has quite overlooked these cases in his well-known work on diseases of the joints, and that Gurlt[2] is the first to describe the occurrence of such consecutive separations of the head of the femur, the trochanter major, and the upper end of the tibia, seems to indicate that, on the whole, these are very rarely met with.

Demme[3] has most recently carefully treated of "osteomyelitis diffusa spontanea," by which term he designates the affection described by Chassaignac. He draws a strict distinction between pure osteomyelitis without phlebitis, and that in which phlebitis plays the principal part. He clearly points out the inherent malignity and destructive character of the latter beyond the former, which can be cured without amputation, and even in some cases without necrosis.

The author having given an interesting historic sketch of the subject of his work—of which the foregoing is a very brief abstract—proceeds to distinguish three several varieties of the disease in question: the circumscribed, the directly traumatic, and the diffuse; in connexion with which last Chassaignac has so much merit that his name may properly be applied to it.

The circumscribed osteomyelitis comes under treatment usually as

1 Mittheilungen aus der chir. Univers.-Clinik zu Göttingen. Hannover, 1862.
2 Beiträge zur vergl. path. Anat. der Gelenk-Krankheiten. Berlin, 1853.
3 Archiv für clinische Chirurgie. Langenbeck. Berlin, 1862.

abscess of the bone, but may also exhibit such results as sclerosis and infiltration of tuberculous masses. But little attention has, as yet, been paid to it.

The directly traumatic osteomyelitis, first described by Cruveilhier and Reynaud as a result of amputation, but which may be developed after any injury in which the continuity of the medullary canal is interrupted—such, for example, as complicated fractures or gun-shot wounds—has been the subject of a long discussion in the Académie de Médecine, in Paris, in 1860, on the occasion of Jules Roux's[1] somewhat too absolute condemnation of secondary operations after gun-shot wounds.

The diffuse osteomyelitis of Chassaignac is defined by the author to be inflammation of the medulla of one or more long cylindrical bones, occurring without lesion of continuity of the medullary canal, either spontaneously or as the result of indirect injury. The term spontaneous, added by Demme, is incorrect, because injuries can, not unfrequently, be traced as the cause of the affection, without constitutional predisposition.

As to the question, whether the disease is to be considered as one belonging to the period of development, the author observes that all the writers who have stated their patients' ages agree that it is connected with the time of life anterior to full growth, and that it is reasonable to suppose that the bones are just then pre-eminently liable to congestion and inflammation, inasmuch as their nutrition and metamorphosis are much more active than at a later period. He adds, that although he, too, has seen the disease only in the young, and has never met with it after the seventeenth year, he does not consider it impossible that it might occur after growth has been fully completed, which is usually the case between the twentieth and twenty-fifth years. Thus Stanley quotes a case in proof that diffuse myelitis may supervene in the course of a violent fever; and he states the patient's age to have been forty. Dr. Studsgaard is, however, not quite satisfied as to the correctness of the diagnosis, the report being short and imperfect.

Osteomyelitic changes have been met with also in a short cylindrical bone—viz., the first phalanx of the great toe, in a long flat bone, a rib, and in the arch of the skull.

The author devotes a chapter to the normal anatomy of the long cylindrical bones, especially with reference to their vascular supply, to the medullary membrane, and to the connexion between the epiphysis and the diaphysis in children and young persons. Into this section of his work we do not think it necessary to enter. Among the writers chiefly referred to are Benson,[2] Sappey, Kölliker, Klose, Duhamel, Bérard, Valentin, Meckel, Henle, Fischer, &c.

As to the pathological anatomy, inflammation of the medulla is accompanied with changes in the compact substance of the bone, in the periosteum, in the epiphyses and in the joints; and it affects, moreover, the soft parts surrounding the bone.

[1] Mémoires de l'Académie de Médecine, May, 1860.

[2] Todd's Cyclopædia, Art. Bone.

In myelitis, upon sudden exudation and transition into suppuration, the medulla is separated from the inner surface of the bone; it is gradually destroyed, and the fat mixes in general with the pus as drops of oil. The cartilage for a time opposes a barrier to the extension of the inflammation to the epiphysis; but not unfrequently it is by degrees perforated, allowing the extension of the suppuration to the spongy tissue of the epiphysis. The meshes of the latter are infiltrated with pus, and by an osteoporotic perforation of the thin compact lamina, the pus may penetrate into the joint, the articular cartilage being also perforated by round cavities. Pus in the joint may also, however, be met with, without direct communication with the interior of the bone.

The articular capsule may now either continue unruptured, notwithstanding the great accumulation of which it is the seat, or it may give way, allowing the suppuration to extend among the muscles in the adjoining part of the limb, with or without osteomyelitic affection of its bone. On longer-continued contact with pus, the inter-articular cartilage gradually dissolves, the epiphysis and diaphysis consequently separating from each other. Separation and luxation may follow inflammation of the joint, and the loosened extremity of the diaphysis may be thrown off, and finally perforate the skin.

Such is the course of the extension of the inflammation in a longitudinal direction; but it also spreads in the transverse diameter. Simultaneously with, and tolerably accurately following the inflammation in the medullary canal, osteitis and periostitis set in; the effusion of the latter soon becomes purulent, and strips the bone externally to the same extent as the internal suppuration occupies, whence results necrosis of the part of the bone, which being inwardly and outwardly denuded, has lost almost all nutrition.

If the patient reaches the second stage, that of elimination and reparation, a sequestrum is, after the lapse of a certain time, formed, which nature endeavours in the usual mode to replace and to remove.

A more destructive (thrombotic) form is described by Klose and Demme; but of this the author has not observed any characteristic examples.

Having given a general view of the pathological anatomy of the disease in question, the author proceeds to describe more particularly the changes in the medulla, the sequestrum, the periosteum, the epiphyses, &c.; but for these details we must refer the reader to the work itself.

The author gives a table of 49 cases of osteomyelitis known to him, from which it appears that separation of the epiphysis occurred in 25, or about one half, being total in 9, and partial in 16 cases. In 7, the upper extremity of the humerus was the part affected; in 2 the lower end of the same bone. In 1 case the upper end of the radius was the seat of the disease; in 4 cases the upper extremity of the femur; in 22 the lower extremity of the same; in 7 the upper end of the tibia, in 2 the lower end of the same; in 3 the upper end of the fibula, in 1 the lower extremity of the same, were the parts affected.

Having devoted some pages to the symptomatology of the disease, the author thus describes its several results:

"The disease may either terminate fatally or it may run a more or less favourable course. Death sometimes occurs in the first week, the patient sinking under the violent fever; but in general the fatal result does not ensue until after the lapse of a longer period; in that case, bedsores are formed, aphthous deposition takes place on the mucous membrane of the mouth, and upon hectic fever colliquative diarrhœa, hypostatic pneumonia, or chronic nephritis supervenes, or purulent infection sets in, and in the usual manner terminates life.

"Or, if the patient's strength be equal to the great requirements placed upon it, recovery may be attained in the following several modes:

"1. The disease may in rare and particularly favourable cases terminate without necrosis; but in other respects this most fortunate result does not differ as to the course of the disease in any essential point from recovery by necrosis, to which I therefore refer the reader.

"What the symptoms would be in case of resolution of the myelitis, I consider to be still uncertain, as I am not aware of any reliable clinical experience on the point.

"2. Recovery may take place after amputation, the indications for which usually present themselves in the third or fourth week; but amputation may also become necessary at a later period.

"3. Recovery may occur by necrosis."

As to the *various forms* of osteomyelitis diffusa, *phlebitic* osteomyelitis may be combined with the pure inflammation. This combination is characterized by the œdematous swelling being more prominent in the commencement, by the suppuration rapidly becoming ichorous, and by the larger venous trunks being frequently obstructed and inflamed. Pyæmia, moreover, in it occurs more frequently, and it is also in this respect more malignant, that recovery with reparation does not readily occur, because the periosteum, muscles and connective-tissue are extensively destroyed by suppuration. In the *multiple* form, several bones are attacked; the inflammation commences either simultaneously in them all, or it is transmitted through articular inflammation to the next adjoining; or, at a later period in the disease, a bone, totally unconnected with that originally suffering, may be affected in the same mode as the latter.

With respect to the *etiology* of the disease, the causes are, as usual, divided into the predisposing and the exciting. First among the former is youth, the disease not being met with after growth is complete. Of 36 cases in which the age is mentioned, 7 occurred between the sixth and twelfth years, 27 between the twelfth and twentieth, and 2 in the twenty-fifth year. Of 36 patients, 30 were males, and 6 were females—a disproportion due, probably, to the fact that the former are more exposed than the latter to the exciting causes of the malady. Rheumatic, scrofulous, and chlorotic affections, want and poverty, damp, ill-ventilated dwellings, may also be classed among the predisposing causes. The season of the year appears to exercise considerable influence, the disease having in 24 cases commenced in the months of October to March inclusive, and in only 10 between April and September, both inclusive. We are thus led to the more directly *exciting* causes—changes of temperature, over-exertion, and injuries.

As to the *prognosis*, of 36 cases, 12 terminated fatally, and 24 favourably, exhibiting a mortality of 33·3 per cent. (not 50 per cent., as stated by the author: it is curious that a similar error pervades most of the calculations in this section of the work). The prognosis in the spontaneous cases is about twice as favourable as in the traumatic. On the whole, the "osteomyelitis diffusa of Chassaignac is one of the most serious inflammations to which childhood and youth are exposed; so that we must attest the truth of Stanley's words, when he says that 'diffuse suppuration through the cancellous and medullary tissue of a bone is usually a most formidable disease.'" (p. 86.)

Passing over the section on *diagnosis*, we come to that upon *treatment*, to which we shall, however, only very briefly allude. Remarking that the time is past when amputation was considered the absolute indication so soon as the diagnosis was looked upon as certain, the author proceeds to describe the treatment which he believes to be the most suitable. Absolute rest is, of course, of prime importance; but beyond confinement to bed, and an antiphlogistic regimen, the employment of local or general evacuations of blood is scarcely advisable, as the patient will need all his strength to bear the profuse suppuration, and it is quite uncertain how far evacuations of blood avail to prevent the development of inflammation of such deep-lying parts. The local application of cold is more advisable. Opium, morphia according to circumstances, and a proper position of the limb maintained by suitable apparatus, are matters of course. The author believes that emollient poultices, employed before exit has been given by incision to the pus, are scarcely of any use, as they only increase the fever and the pain, while their removal and application interfere with the complete rest of the part, and, if long continued, they produce eczema and excoriation of the skin. Resolvent liniments, with extract of Belladonna, may be used. So soon as a distinct fluctuation is perceptible, whether this be sub-periosteal or sub-aponeurotic, incision is urgently indicated, and upon the extent of the fluctuation and its position depend the size and proper locality of the opening. Where a small incision appears to be insufficient, the author would be more inclined to recommend two, at two, or at most three inches from one another, to a larger one, as the discharge takes place more readily through an opening and counter-opening than through a single orifice. The author enters very fully into the details of the surgical treatment of the disease, giving a useful and highly practical chapter upon this part of the subject; and he concludes his very interesting memoir with the notes of twelve cases of the affection, illustrating its appearance in various parts of the body. On the whole, his volume will be found to contain an admirable history of our knowledge of the disease of which it treats, enriched with the personal experience of an accurate and practical observer.

Review VI.

1. *The Sanitary Commission, The Sanitary Reporter, The Sanitary Commission Bulletin.—New York and Louisville.*

2. *A Woman's Example and a Nation's Work. A Tribute to Miss Nightingale.—London,* 1864. pp. 99.

In former numbers of our Review we have made its readers partially acquainted with the organization and working of the United States Sanitary Commission,—a noble and patriotic undertaking, conferring infinite credit on the people to whom it owes its origin, its continuance, and increase, so as to have become a powerful institution, and likely to be permanent so long as the war, still raging, may last and need its aid.

The idea of a sanitary commission for inquiry and advice, it is acknowledged, was not a new one, having been derived from that which was of such eminent use to the suffering British army in the Crimea, where, in consequence of the wise measures suggested and a change of circumstances, a mortality which for a time amounted to 97 per cent. per annum from disease alone, was reduced, wonderful to say, to 1 per cent. It might have been added, that the supplementing the government supplies to the United States armies had a precedent also in the same war. How well we remember the emotion created by the distressing accounts of our destitute troops during the most trying time of the siege of Sebastopol, and the efforts which were made at home throughout the land to relieve them! The United States Commission has happily combined both functions—that of advice following careful inspection, and that of supplementing relief on a system that surprises one by its vastness of scale and admirable organization, deriving all its means from voluntary subscription.[1] The agencies which it employs, as enumerated by the able secretary of one of its departments, Dr. J. S. Newbury, are the following:

"First, its system of inspections—general and special—for the prevention of disease and the investigation of wants. Second, its system of general relief; for the production, transmission, and distribution of needful supplies not furnished by the Government. Third, its system of special relief for procuring papers, pay, transportation and pensions for discharged soldiers, and all those requiring this sort of assistance. Fourth, its system of publication; for the dissemination of sanitary knowledge, technical or general, through the medium of the press. Fifth, its soldier's homes. Sixth, its Hospital Directory. Seventh, its system of transportation of sick and supplies by Sanitary Commissioner steamers and hospital cars."

[1] It is stated by the President of the Commission, the Rev. Dr. Bellows, in the bulletin of the 15th March, that the funds subscribed then amounted to eight millions of dollars, and that the cost of collecting and distributing supplies has been less than three per cent.! He further states:—"We reckon that if we divided all the aid we have given to the sick in regimental, general, and other hospitals, to men in peril of sickness from scurvy and exposure, it would amount to 3·50 dollars a case. Many men have received this several times, as often as they were sick. The seriously wounded have often been the receivers of as much as ten dollars per man."

The manner in which the doings of this Commission are considered and the high estimation in which its labours are held, are best shown by the following resolution, one of those passed by the Ohio Legislature on the 13th April last. We quote it *in extenso*, as briefly describing what the Commission attempts, and has, it is understood, well accomplished :—

"Resolved, That in the Sanitary Commission we recognise an institution eminently qualified to accomplish the object had in view in its organization, to wit, to be an auxiliary to the Government, supplementing its efforts in providing for the comforts of the army, by procuring and transmitting delicacies and medical stores for the sick, clothing and provisions for the needy, and whatever else is calculated to soothe, to comfort, and to bless; which undertakes as a kind friend and companion to follow the soldier in his marches, administering to him, in sickness or health, the bounty of his friends, or of a benevolent public; cheering, consoling, and sustaining him when the shock of battle has left him wounded and fainting upon the field; as an angel of mercy appearing to remove him to a place of shelter, where his wounds may be dressed and remedies applied for his recovery; or if death at once should close his suffering and existence, to insure him a decent and respectful burial; if disabled in battle or broken in health, requiring his discharge from the service, far from friends and destitute of means, which volunteers to furnish him advice and assistance, and to provide him in the Soldiers' Home a resting-place until he can be safely conveyed to his family and friends. We can but admire the humane and generous spirit which promoted and sustained this movement, and deem it proper to extend to all who co-operate in this noble undertaking the well-earned tribute of the thanks of this General Assembly for the zeal, energy, and good results which have attended its prosecution in the past, and most cordially commend it to the kind consideration and confidence of the public, in the hope that its good fruits in the future may be even more abundant."

'The Sanitary Reporter and Bulletin,' to which it is time to advert, are the productions of the Commission. The first was begun in May the 15th, of last year, and the latter on the 15th of November. Both are bi-monthly publications, and of both there are large impressions; of each number of the 'Reporter' six thousand copies are printed; of the 'Bulletin' ten thousand; and it is stated that they are probably read by fifty thousand persons.

The mission of the 'Reporter,' we are informed, is to make known the proceedings of the Commission in its multifarious functions; indeed, the disseminating this knowledge, it is stated, will be one prominent aim of the journal. In each number intelligence is promised, direct and reliable, from the army regarding the health of the troops, their condition and necessities, and this in the hope of allaying unnecessary alarm, and of enabling the patriotic and benevolent at home to furnish the means in advance for the prevention of suffering and death. As further explanatory, we quote the following:

"With the reports of the condition and wants of the troops in the different departments, sketches will be given of the work of the Commission, in all its varied efforts to promote the welfare of the soldier, expositions of its aims, and records of its successes. From the home-field, where that other great army of mothers and sisters, wives and sweethearts, is working, and watching, and praying, we shall hope to have frequent good words that shall cheer all loyal hearts, and fire anew the enthusiasm of both soldiers and people. From the 'Soldiers' Homes,' the 'Hospital Cars,' the 'Sanitary Steamers,' the hospital visitors, from the surgeons of hospitals and regiments, in short, from all the friends of the soldier everywhere, we shall hope to get reports, notices, suggestions, appeals, and testimonials, by which we shall be instructed and encouraged in our work. Questions in sanitary science, especially those relating to the health of the army, will be discussed. The most available means of applying the principles of correct hygiene to ventilation of quarters and hospitals, the best mode of cooking army rations, the policing of camps, and so to the prevention of disease, will furnish opportunity for calling out the best experience of the medical and military officers in our army and navy. Further than this, we promise not. What may become of it, time, the great revealer, alone can show."

How much of humanity there is in all this! How does it compare, as a test of the people and the stage of civilization, with the shortcomings we are sure of in the Wars of the Roses, or in the later great civil war, or, indeed, in any modern war that has been waged either in Europe or Asia! Well may it be said with regard to the Federals, whether we sympathize with them or the Confederates in the tremendous struggle now going on, that never before has the world witnessed such a systematic organized effort to assuage the horrors of war.

The numbers of the 'Reporter' now before us, altogether ten, reach only in regular sequence to the 15th of August. They afford satisfactory proof of a great success. In the May number, it is recorded that the Commission had then expended over three hundred thousand dollars in cash, and had distributed hospital stores to the value of millions; that at that very time over a thousand dollars in cash, and ten thousand articles of clothing and diet were expended and issued daily. Every number contains interesting matter and much useful information, and so varied that hardly any class of readers can peruse them with feelings of indifference. Each is a miscellany more or less depicting the horrors of war, and the humane efforts to meet and moderate them; affording a remarkable example of what can be accomplished in a great cause by a free and energetic people; and, at the same time, showing in the most striking manner how much their hearts are in their cause, and how strong and sincere is their determination to support it at all risks and at all costs. In reading them, we have marked many passages as noteworthy; we can advert only to a few.

In relation to the health of the troops, the importance of vegetables as a part of their dietary is much insisted on. One of the Commission's inspectors remarks:

"We find in the absence of a vegetable diet a cause for a great part of the mortality of our troops, both after the receipt of wounds and from disease. Indirectly it may account for suppuration, gangrene, pyæmia, erysipelas, diarrhœa, dysentery, fever, rheumatism, &c., and we fully believe that one barrel of potatoes per annum is to the Government equal to one man."

He suggests that when, from the season of the year, neither fresh potatoes nor onions can be furnished, the troops should be supplied with pickled onions and cabbage, and also with potatoes, cut in slices and packed in molasses to be eaten raw, as is the practice with sailors. To facilitate a good supply of these wholesome articles, gardens are attached to their hospitals. An agent of the Commission writing in April from Murffresboro, Tenn., says:

"Yesterday I furnished additional tools and seeds, and ten barrels more of potatoes, for the hospital garden, and on visiting the grounds found between thirty and forty men busily at work preparing the ground, enriching it and putting in the seed. The products of the garden will be ready when the supply of vegetables from the North temporarily fails, as it necessarily must in the latter part of summer."

By another agent of the Commission it is suggested, with a view to a sufficient supply of vegetables and fruit—

"That every one that can, appropriate a certain piece of ground to raise vegetables for the soldiers—*onions*, *potatoes*, *cabbage*, and *tomatoes* will be needed in large quantities. Let every child have his soldiers' garden, and cultivate it well; and when small fruits begin to ripen, there should be an *army* of *boys* and *girls* picking, drying, and canning. *Don't let any go to waste.* And when apples and peaches ripen, be prepared to dry large quantities. Every soldier should have his full share. They deserve it at our hands, and now that arrangements are so perfected that the soldier will be sure to get them, every friend should do all he can to supply them."

Another agent writing in June states, that the sick are already receiving substantial benefits from the hospital gardens. He adds:

"To the ladies of the Soldiers' Aid Society of Northern Ohio, the sick in the field-hospitals are indebted for a fine supply of flower-seeds and bedding-out plants, which the gardener has used to the best advantage for giving a cheerful character to the hospital grounds."

These passages we have been the more induced to transcribe, keeping in mind how much the subject of fresh vegetables and fruits, as articles of wholesome diet, has been neglected by our army authorities, with, as might be expected, a thorough neglect of their cultivation. In all our experience at home and abroad, even during a period of peace, we have never known, not even in the tropics, a garden attached to a military hospital or to a barrack for the use of the men. Need we say how agreeable would be its culture, how profitable its produce with proper superintendence. The culture would afford healthy and refreshing exercise, an amusement rather than a labour; and its produce would be doubly acceptable from the manner in which it would thus be raised; that ennui, that *tædium vitæ* prompting to suicide or desertion, too common in our regiments when serving listlessly in garrison aboad, would, we have little doubt, be checked, if not altogether prevented. When we reflect on what is known of the treatment to which the soldier *was* subjected, it seems difficult, reflecting on the blunders committed, to reconcile the orders under which they were made with common sense or common humanity.

Another matter of diet is dwelt on, of almost as much importance—the supplying, namely, of the troops in the field with condensed milk, concentrated beef, crushed sugar, farina, and canned fruits; and, in the advanced spring, with pickled and desiccated vegetables, inasmuch as at that season no fresh vegetables, with the exception of potatoes, can withstand "the destructive and reproductive influences" then in action. Very many instances are given of the improved health of the troops and the disappearance of incipient scurvy as soon as vegetables could be procured, aided by increased attention to modes of cooking and to improved arrangements for sleeping. "Excellent beds" are described as "built upon forks driven into the ground," with a layer on them of pine and hemlock boughs. In accordance with a large experience we find it recorded that the sick and wounded recovered best, and there were fewer deaths in tents than in houses.

It is refreshing to see amidst the horrors of war demonstrations of some of the best feelings of human nature. Anecdotes in the 'Reporter' illustrative of this are prefaced with the remarks, "Rustic Sydneys are so common we have ceased to think of it." "I guess that next fellow wants it more'n I do." "Wont you jus' go to that man over there first, if you please, marm? I hear him kind o' groan jus' now; must be pretty badly hurt, I guess; I ha'n't got anythin' only a flesh wound!" We are told "you may always hear such phrases as these repeated by one after another as the ladies are moving on their first rounds." Of the deplorable horrors of war, as shown on the battle-field, instances are not wanting, nor are they wanting in the hospitals of the beleaguered forts, such as those of Vicksburg, on surrender after protracted resistance. After the battle of Gettysburg, the wounded left on the field amounted, it is stated, to "20,000 national and rebel soldiers;" and we are informed that owing to the pursuits of the enemy only one-third of the surgeons, ambulances, and waggons could be left from each corps in care of the wounded, and no detail of uninjured men to nurse them.

"Add 600 rebel wounded, deserted by all but five of their own surgeons, and one sees the inevitable misery of their situation. There was most inadequate supply of coarse food. Transportation for the wounded from worse to better quarters and of supplies was necessarily very scarce, and was a chief source of distress. The roads were thronged with wounded men—here on canes, and there on crutches, not seldom with amputated arms and hands still bleeding—working their way from the camp hospitals two, three, and four miles to the depôt. At the hospitals themselves, at first the spectacle was intensely wretched. Men with both legs shot off, shot in the eye, the mouth, both hands gone, or one arm lost, were lying in rows that seemed pitiable, and in wonderful patience, fortitude, and patriotic pride facing their sufferings. The rebels, as was just, had to wait their turn for having their wounds dressed, or their limbs amputated, till the Union men had been cared for; *then*, they were treated with equal kindness and attention. Many after six days were looking forward as to an unspeakable blessing for the amputation of their shattered limbs. The terrible destitution of many of the rebels will not bear description; it was too horrible for recital."

At Vicksburg, on the taking of that fort, between six and seven thousand sick and wounded were found left in hospital. Their condition is described as destitute of the actual necessaries of life, and consequently, it is said, they were unavoidably filthy. This their state is mentioned by the superintending surgeon who visited them and made an appeal for their relief.

It is satisfactory to find that the medical officers attached to the U.S. great armies have gained credit by their conduct. As a class, they are described as being "the most hard-working, self-denying, earnest, and conscientious officers" in the service, and as being well qualified, after having passed a rigid examination. Their status seems to be higher than that of their European brethren, inasmuch as, in the absence of a commissioned officer, they may take the command of a post, or lead men in battle. The rank of a surgeon is that of major. That this liberal treatment is for the interest of the service we firmly believe; would that our Government were so persuaded and acted on the conviction, then we should not hear of broken faith and consequent discontent; we should cease to hear of the straits of the medical department, of vacancies not filled up, and of the necessity (if it be a necessity) to extend the limit of age of candidates to thirty, with other makeshifts for the purpose of keeping up a sufficient—would that we could add an efficient—medical staff.

Of the negroes who have escaped from their masters but little information is to be found in the 'Reporter.' Under the head of "Negro Hospital," which was organized in November, 1862, for the care and treatment of "contrabands," as these poor runaways in the pursuit of liberty are designated, the mention that is made of them is on the whole favourable. "Their labours," it is stated, "about the building, had been quite valuable, more so than is placed to their credit." It is added, "they manifest a desire to learn to read, and in the month of May a Sunday-school was organized for all who would attend. It has progressed admirably, a large majority taking a lively interest in improving their new privileges. It was interesting to witness all grades and ages sitting together, from the little sable urchin to the old man and woman with gray hair, starting together at the first letter of the English alphabet, as though they had dropped from some planet where letters had never been known, and where the luminous pages of Holy Writ had never been permitted to dawn upon its inhabitants."

These negroes remind us of another class of the same race, not adverted to in the 'Reporter,' who, from good treatment, had become attached to their masters, so attached that when they had the opportunity of leaving them and of obtaining their freedom they did not avail themselves of the chance. We have been informed by an English gentleman who was present, when about 15,000 Confederate troops, after the capture of Vicksburg, marched out of that fortress, hardly a slave-servant deserted his master; he was seen, in the great majority of cases, heavily laden trudging after his owner.

Our limits warn us that we must hasten to a conclusion, and this we must do, leaving much that is interesting and characteristic of the people of the Northern States unnoticed. Miscellaneous as is the 'Reporter,' the 'Sanitary Commission Bulletin' is even more so; yet nothing appears in either of them that is destitute of interest, or, though occasionally tedious from repetition, undeserving of perusal. Many useful suggestions and directions are to be found in them of a sanitary kind, and many important questions are discussed in them of army hygiene, with illustrative examples of daily occurrence. The reports from the field constitute the most valuable portion of the 'Bulletin.' One event has a conspicuous place, and deservedly, in this periodical—viz., "The North-Western Fair," which was held at Chicago under the immediate auspices of the Chicago Branch of the U.S. Sanitary Commission. It was opened October 27th, and kept open until November 7th. The account of it—that a very animated and stirring one—occupies several pages. It is described as being "glorious, as a great success," as having realized about sixty thousand dollars—enough, it is remarked, "to carry comfort, health, *life* to many, many of our brave defenders in the field." Such are a few of the words of the 'Reporter.' But besides its material profits, stress is specially laid in the detailed narrative in the 'Bulletin' on the impulse it imparted to unite as one people the thousands which were then assembled from Illinois and Indiana, from Michigan and Missouri, from Wisconsin and Iowa, and to strain all their energies in support of the great cause of national union—states' union seemed forgotten—and of the greater, as we think, and nobler cause, that of slave emancipation. In the description of this remarkable Fair there are many touching traits given, and often in eloquent words of emotion, proving that there was a soul, a moving mind in the work, such as is witnessed only on great occasions, and is productive in action of great events. This fair has been followed by others even on a larger scale, and proportionately more productive, at Boston, Cincinnati, and New York. The last-mentioned, it is expected, will contribute to the funds of the Sanitary Commission 500,000 dollars.[1]

The publication which forms a part of the heading of this article, under the somewhat obscure title of 'A Woman's Example and a Nation's Work,' comprises a general account of the U.S. Sanitary Commission. Our notice of it must be very brief. Written evidently by one well acquainted with the Commission from its beginning, and generously written, we can recommend it strongly to those who are desirous of acquiring a more connected and comprehensive knowledge of it from its origin to the present time than our more limited and detached notices can afford.

Review VII.

Guy's Hospital Reports. Edited by Samuel Wilks, M.D., and Alfred Poland. Third Series. Vol. IX. 1863.—*London.* pp. 343.

The present series of these Reports consists of ten articles, which we propose to analyse *seriatim.*

I. *On the Syphilitic Affections of Internal Organs.* By Samuel Wilks, M.D.—In this paper, Dr. Wilks enters upon a rather novel path of investigation, inasmuch as the diseases of internal organs, traceable to the syphilitic poison, have been but little studied, and indeed the specimens exhibited in illustration have been received

[1] Since reported to have amounted to about a million.

until very recently with something like incredulity. It is admitted, and even urged by Dr. Wilks, that this class of diseases is not by any means very common, and the large field of observation afforded in Guy's Hospital exhibits as yet but few specimens. This statement is advanced, in answer to those who have remarked that at the hospital in question the syphilitic diseases of internal organs, like specimens of Addison's disease of the supra-renal capsules, are of daily occurrence. The fact is that the cases adduced by Dr. Wilks are but few in number, especially when the doubtful ones are excluded; but still he thinks the Report is sufficient to prove the great fact which he wishes to establish—namely, that the syphilitic affections are more widely diffused through the system than was formerly considered to be the case.

The reason of the disbelief generally entertained as to the existence of syphilitic diseases of internal organs is to be found in the artificial division of the healing art into medicine and surgery, the result being that a disease which really affects the whole body is regarded only in a partial light, as it happens to come respectively under the cognisance of the physician or the surgeon. This remark is especially true in relation to syphilis, which affects almost every tissue in the body, when the virus has once entered the system, and displays itself in a peculiar and characteristic form.

It has hitherto been said that every part of the body which could be seen or handled, or which could present any outward signs of disturbance, might be affected with syphilis; but it was only occasionally suspected that the internal organs could be contaminated. Thus the skin and its appendages, as the hair and nails; the bones, especially those that might be felt during life; the eye, but only a part of it, as the iris; the interior of the mouth, as far as vision reaches;—all these parts have long been known as the seats of syphilitic disease; but even at an early period it was admitted that the same disease might affect the testes, which are really viscera, although placed externally to the body in the human subject. The surgeon, therefore, in former times, perceived the effects of the syphilitic poison as far as he looked for them; but it is now maintained that, in consequence of the more frequent practice of post-mortem examinations, it is proved that syphilis may influence every tissue of the body, and that therefore the internal organs may be attacked with the poison as well as the external. The modern doctrine advanced by Dr. Wilks is that the internal and external organs are equally affected, and that not only the cranium, but the brain within it, or the nerves; not only the muscles of the limbs and tongue, but the heart; not only the pharynx, but the œsophagus; not only the larynx, but the trachea, bronchi and lungs; besides the liver, spleen, and other viscera, may all be diseased by the effects of the syphilitic poison.

The peculiar effects of syphilis on the system consist in a disposition to the effusion of a low form of lymph, or fibro-plastic material, in nearly every tissue of the body, sometimes slightly modified in character by the nature of the organ in which it occurs. In those who have died suffering from the disease there is scarcely an organ which may not be thus affected; in solid organs, or the interior of the tissues, there is found a more or less circumscribed deposition of an albumino-fibrous material, while on the surface of the body the same material may constitute merely the base and border of an ulcer, just as cancer and tubercle may exhibit themselves as masses of disease in the solid organs, and as ulcers on the skin or mucous membranes.

The above-mentioned deposit takes place in constitutional syphilis, and Dr. Wilks explains what he understands by the latter term. The disease has hitherto been divided into primary, secondary, and tertiary; but, although the distinctions between the first and the second kind are well marked, those which separate the second from the third are by no means well defined. Thus some forms of eruption, as the scaly and papular, are called secondary, while others of the vesicular and ecthymatous kinds are named tertiary; and some writers have stated that while the effects of syphilis are confined to the external parts the disease is secondary, though if they attack the internal and deeper structures it is tertiary; but this statement is made only because the first class of symptoms is visible during life, and the second is discovered only by post-mortem examination, although it is by no means proved that they are not contemporaneous in their occurrence. Thus it is altogether an assumption that effused lymph on a bone, and effused lymph of the same character in the liver, occur at different periods from one another, and the supposition is founded only on the circumstance that one is found at a later period than the other, and hence is hastily supposed to be later in its origin. The fact is, that the development of secondary symptoms on the surface of the body is evident, while that of the same kind of symptoms in the interior is hidden, although both may have occurred simultaneously. Dr. Wilks evidently thinks that there is no true distinction between secondary and tertiary syphilis.

The next points to be determined are the meaning of primary syphilis, and the distinction between it and constitutional syphilis. The first sore on the surface of the body is said to constitute the primary disease, and if this sore is not readily healed, and the system becomes contaminated, secondary symptoms are said to result. The consequence of such a definition is, according to Dr. Wilks, that primary syphilis is not syphilis at all, and he ingeniously argues that a person who has only a primary sore which readily heals can no more be said to have syphilis than a person who has been unsuccessfully inoculated for variola can be said to have had small-pox, or one who has been merely bitten by a mad dog can be said to have had hydrophobia. This view is, in fact, entertained by Ricord, who divides the sores, according as an induration exists or not, into infecting and non-infecting, the fact being that the induration proves the constitutional nature of the affection by the peculiar deposition of fibro-plastic elements, while the absence of induration, and the non-infecting character prove that the constitution has not been affected at all. Hence the term syphilis ought only to be applied to the constitutional malady, and Dr. Wilks proposes that the distinction between primary and secondary should be abolished, and the simple term syphilis be used instead. Besides the affections of the bones, the skin, and the larynx, there are other changes in the organs which have been lately traced to syphilis, especially the lardaceous or waxy disease of the viscera, although these affections are by no means exclusively the results of the syphilitic poison, but only its occasional sequelæ.

Dr. Wilks proposes the following view of this part of the subject—namely, that the so-called secondary syphilis should be simply styled syphilis, and that this disease should be considered to exist as long as certain phenomena occur, as exemplified especially by the exudation of lymph in the tissues of the body, thus showing that a morbid action is still in existence, and that there is a virus capable of being propagated in various direct and indirect modes. This virus may be exterminated by remedies, or may wear itself out, and the patient may recover his health; but not unfrequently a morbid state of the system may be produced, tending sometimes to a fatty degeneration of the various structures of the body, but more especially to the change known as lardaceous or waxy. This might with more propriety be termed the second stage, or even the tertiary stage, but is to be distinguished from the preceding, inasmuch as the virus was then still present, whilst in the latter it has departed, the changes in the tissues being attributable to the cachectic condition, and therefore not unlike what may arise under other circumstances. Dr. Wilks proposes to divide the disease into syphilis and its sequelæ, meaning by the term syphilis only the constitutional affection.

It is impossible to discuss the subject of syphilis and its sequelæ in the present day without adverting to the conflicting opinions at present existing on the subject of the effects of mercury upon the disease in question. Some of the old school of physic think that the prolongation of syphilitic diseases in the present day is due to the diminished use of mercury, while many of the modern school attribute the ravages of the complaint in former times to the too free administration of the mineral. Many eminent authorities maintain that some of the worst forms of disease observed in syphilitic patients, especially the necrosis of bones, are due to mercury; but Dr. Wilks asks how this view is compatible with the fact that mercury does not affect the bones? Experiments on animals have repeatedly shown that the bones are not affected by the administration of this metal, and Dr. Wilks has seen several cases of mercurialism induced in artificers in quicksilver, in whom most of the structures of the body were decayed and the mind impaired, but in whom the bones were uninjured. It has also been said that mercury produces other effects resembling those of syphilis; but Dr. Wilks believes that this statement is the reverse of the truth, for the tendency of syphilis in the constitution is to produce a plastic lymph in the tissues, whereas the effects of mercury are directly antagonistic, and tend to the absorption of the new tissue, if any such exist, and if it does not, to the destruction of the old. In syphilis, in fact, Dr. Wilks observes, there is a formative action at work, whereas the action of mercury is merely a destructive one.

The contradictory opinions entertained on this subject may be reconciled by dividing the disease into syphilis and its sequelæ, for then the former or secondary state shows the effects of the virus in the albuminous deposition, while the sequelæ exhibit the degeneration of the tissues from the long continuance of the morbid action. Now, mercury opposes the first, but favours the second, and hence, perhaps, the opposite views entertained upon the influence of the drug upon the disease in general. In disease of the bones, characterized by true syphilitic caries, Dr. Wilks considers that mercury may be useful, but if disintegration of the structure has commenced it will be injurious; and thus the apparently conflicting statements of its beneficial and injurious effects may be explained.

The effects of syphilis on the system will vary in some degree according to the nature of the structure attacked. On the skin and mucous membrane the tissue may soften and ulcerate, but on the bones there will be an exudation of lymph between the bone and periosteum. This node is very inert, but, if not removed by remedies, it may ossify, or may soften and involve the bone in caries. So also lymph is deposited upon the iris; and condylomata or mucous tubercles, and some tubercular eruptions of the skin, are all recognised as effects of the virus. Very lately nodules of lymph have been observed in the tongue, and more recently they have been found in other muscles of the body. The character of the syphilitic deposit in a muscle may be taken as that which prevails more or less in all other organs, and consists in the development of a rounded hard lump, felt through the integuments, and forming a tumour. The exudation appears to have been originally soft and albuminous, and to have infiltrated the tissue, so that the lymph and the original structure of the part are found incorporated; and even when the whole has become hard, if the part be examined microscopically, the muscular structure will still be found present; and if appropriate remedies are given at an early period, the adventitious material will be absorbed, and the tissue left in its original integrity. Such is not the case with cancer or tubercle, which are circumscribed, and are constituted of the new material which has been thrown out.

In the liver the same process occurs as in muscle. In this organ hard, fibroïd nodules are found, more or less circumscribed, but shooting out their fibrous roots into the surrounding hepatic tissue; and owing to the contraction which takes place, there is often left a remarkable cicatriform appearance on the surface. It is this exudation of lymph or fibro-plastic material and subsequent contraction which characterize the disease. The deposit met with in the liver and other organs has generally existed for a long time before it is noticed, and it is then found, when microscopically examined, to contain fibro-plastic elements, small nuclei, fatty granules, and some amorphous matter. It cannot be affirmed that the syphilitic deposit is peculiar and distinguishable from all others, since no elements possessing any peculiarities are found in it; but nevertheless, if nodules of the fibroïd tissue just described should be met with in the liver and other parts of the body, a strong suspicion would be excited as to the nature of the disease, and should they be associated with other conditions usually recognised as syphilitic, the proof would be as satisfactory as that of any other disease. The difficulty of distinguishing clearly between a syphilitic and a non-syphilitic deposit is certainly a weak point in Dr. Wilks's theory, but the author thinks that time will probably evolve some feature which will render the diagnosis clear.

The *liver* appears to be the organ pre-eminently selected as the seat of the syphilitic formations: these were described in 1855 by Mr. Busk, in his translation of Wedl's 'Pathology,' and soon afterwards Dr. Wilks exhibited some specimens at a medical society. Wedl showed that after inveterate syphilis the liver frequently presents a cicatriform tissue on its surface, which may extend deeply into the parenchyma; and he also noticed scattered nodules, consisting, like the cicatriform contracted parts, of connective tissue. In the cases now described by Dr. Wilks, the liver presented generally a number of rounded nodules, placed towards the surface, of different sizes, varying from that of a pea to that of a marble. They were for the most part hard, only one or two showing signs of softening in their centres. When old they were more or less circumscribed, though sending out branches of fibrine into the surrounding tissue, and by the contraction which had taken place a cicatriform appearance had been produced, resembling that caused by the syphilitic affections of the skin and mucous membrane.

The same appearances as those just described are found in cases of congenital syphilis, but Dr. Wilks has not been able to verify the fact from his own experience, as he has only had an opportunity of dissecting two syphilitic infants since his attention was directed to the subject, and in these the fibroïd nodules were not well marked. Professor Thiry has, however, recently exhibited a specimen from the liver of a fœtus affected with hereditary syphilis, and the alteration was found to consist in the deposition of numerous ovoïd kernels, of varying dimensions, and of fibro-cartilaginous hardness.

Dr. Wilks then proceeds to describe the appearances presented in the liver of many subjects which came under his observation, both in the wards of Guy's Hospital and in the museum of the same institution. The history of many of the cases is necessarily obscure, because the nature of the disease was not suspected in many instances, but the similarity of the deposit in all the cases described induces him to believe that it had a common origin. In a few of them the history was pretty satisfactorily made out, the symptoms during life being studied in connexion with the post-mortem appearances.

The *spleen* is not frequently the seat of syphilitic disease, or at least its peculiarities in this respect are not sufficiently well marked to be easily appreciated, and Dr. Wilks therefore relates only a few cases where the spleen presented the diseased condition in common with the liver or testes.

The *lungs* are probably more frequently the seat of syphilitic deposits than is generally believed, although the supervention of phthisis on syphilis is a fact generally known. Owing to the difficulty of distinguishing between the tubercular deposit and that of syphilis in the lungs, Dr. Wilks adduces only two cases; but he remarks that the syphilitic cachexia resembles that of scrofula, and he leans to the view of some who think that the scrofulous diathesis is nothing more than a phase of hereditary syphilis.[1]

Ulceration of the *larynx*, as an effect of syphilis, is of a peculiar kind, characterized by the production of a fibro-plastic material, which is always tending to harden and cicatrize under the curative process; and when the cure is completed by remedies, the affected part is puckered, hard, and shiny. The great peculiarity of the syphilitic affection, however, lies in the production of a fibroïd material in the affected part, without any necessary ulceration. The *trachea* and *bronchi* are also proved to be liable to syphilitic disease, of which Dr. Wilks gives four examples. The *pharynx*, when attacked with syphilitic ulceration, presents well-known characters, consisting of deep excavations and hardened borders, leaving an indurated cicatrix when the ulcer has healed.

The existence of syphilitic nodules in the *tongue* has long been recognised, and for several years the same deposits have been described in other muscles of the body. The nodules may be found occasionally in all the muscles, but they appear more frequently in the fore-arm and leg, and the sterno-mastoid muscle is sometimes found so affected.

The *heart* is now proved indisputably to be the occasional seat of the syphilitic deposit, but Dr. Wilks has not found, in his own experience, a case sufficiently well marked to be introduced in his series, although he gives a drawing of a deposit, which he believes to be of a syphilitic nature, found in the septum of the heart.

The *brain* and *nerves* are probably affected by the syphilitic poison, but the exact changes which occur have not yet been fully investigated. In all Dr. Wilks's cases the new material has been on the surface of the brain, and involving the membranes. The character was very uniform, and consisted in the union of the brain and membranes by a firm exudation, similar to that met with in other parts, the neighbouring bone not being necessarily affected, although this was once supposed to be the case.

The *eye* is affected by syphilis, as in the well-known occurrence of iritis, and in the "syphilitic interstitial keratitis" described by Hutchinson; the *teeth* are proved to undergo a morbid alteration from the same disease; the *nose* appears to be flattened, owing to an expansion of the nasal bones during an infantile periostitis; and the *ear* may be affected with syphilis in three different ways—namely, from disease of the bone, from affection of the auditory nerve, or from contraction of the Eustachian tube in connexion with ulceration of the pharynx. The syphilitic affections of the *skin* are universally known.

The *testis* is very commonly affected, and in a very characteristic manner. "A section through it shows a number of nodules of a firm yellow material, more or less circumscribed, but generally associated with some fibrous tissue pervading the gland-structure around, and causing its contraction." This affection is of course to be distinguished

[1] With reference to syphilitic affections of the lungs, we would recal to the reader's mind a notice of Pulmonary Lesions associated with Syphilis, by Dr. Aitken, which appeared in the Annual Report of the Army Medical Department.

from ordinary orchitis, which is not usually the result of syphilis, and is a painful disease, while the syphilitic affection is painless in its character, is often unsuspected during life, and may occur in children who are the subjects of hereditary syphilis.

The similarity existing between the effects of scrofula and those of syphilis is so great that some writers imagine that the former is nothing more than hereditary syphilis; and Dr. Wilks adduces a case in which it was exceedingly difficult to determine whether the appearances observed were due to one or the other disease; but he thinks that the effects of mercury, which is beneficial in syphilis but injurious in scrofula, may aid the diagnosis. Two other cases are given, in both of which there were indications of scrofula, but strong suspicions likewise existed of hereditary syphilis; and in one of them the administration of mercury was followed by decided benefit.

The syphilitic diseases of the *placenta* are at present rather suspected than absolutely proved, and Dr. Wilks has no observations of his own to offer upon this subject; but Mr. Wilkinson King has left behind him notes of several cases of abortion, which he supposed to be caused by a syphilitic disease of the placenta. The appearances observed, however, were not very definitely described, and it is not certain that they would be admitted into Dr. Wilks's collection; but it is proved that, in some of the cases, abortion took place, and a deposit of adventitious matter was found in the placenta, and moreover, under a course of mercury, the mothers subsequently bore children.

The syphilitic diseases of *bone*, although hitherto assumed to be of the ordinary kind, are now proved to be peculiar; and Dr. Wilks has no doubt that they are due to the disease, and not to the admistration of mercury, as some have supposed. The preparations in the museum of Guy's Hospital show that sometimes, instead of caries taking place as the result of syphilis, the exudation ossifies, and thus the bone becomes much enlarged and hypertrophied; and "herein lies another argument," says Dr. Wilks, "against the affections being due to mercury, since the property of the latter drug is to destroy or disintegrate;" while in syphilis there is a disposition to develope an albuminous exudation beneath the periosteum and in the vascular canals of the bone. This may ossify, producing enlargement or hypertrophy of the part, or if ulceration takes place, a caries may result; but here, as in the soft parts, a distinguishing feature is the presence of a new material around the diseased structure.

II. *On Pulsating and Aneurysmal Tumours of the Abdomen.* By S. O. Habershon, M.D.—Dr. Habershon commences his paper by observing that pulsation may be communicated to a growth by contact with a large artery, so that this sign does not necessarily prove the existence of an aneurysm. The symptoms of aneurysmal disease in the abdomen may be regarded in three aspects—namely, the *negative signs*, the *character of the pain*, and the *character of the pulsating tumour*. Among the *negative signs* are the absence of constitutional disturbance, the absence of the symptoms of organic gastric disease, the absence of effusions into the peritoneal cavity, and the normal character of the urine. *The character of the pain* is of a twofold kind, one being constant and uniform, and the other more intense and paroxysmal; the former being wearisome and distressing from its duration, the latter agonizing in its severity. The pain is without febrile excitement, and there is generally neither rigor nor perspiration, as in hectic fever; it is traced along the course of the spinal nerves in the loins, or it extends to the anterior walls of the abdomen, and there are sometimes cramps in the legs, numbness in the feet, or pains in the joints, simulating rheumatism. But although pain is generally a prominent symptom, there are certain instances where the patient does not complain of it at all, and the first indication of the disease may be a fatal rupture of the aneurysm, or it may only be discovered on a post-mortem examination, the patient dying of some other malady. *The character of the pulsating tumour* is an important sign of abdominal aneurysm. It generally occurs near the commencement of the abdominal aorta, in the neighbourhood of the cœliac axis, and as it passes downwards it is found more frequently on the left than on the right side. The pulsation is generally uniform, and said to be diastolic; but it is sometimes very difficult to find an interval between the systole of the heart and the aneurysmal impulse, and a bruit may often be heard at the site of the tumour, although this symptom is not unfrequently absent.

Abdominal aneurysm terminates in three ways—namely, by producing gradually increasing exhaustion, or by rupture, or its further increase is prevented by layers of fibrine, and it may be said to be cured. Of these modes of termination rupture is the most frequent, and if the blood is effused behind the peritoneum, the patient may at first experience a temporary relief to the pain, but if the rupture takes place into the peritoneum the tumour suddenly subsides, and syncope is at once fatal.

The *diagnosis* of abdominal aneurysm is often obscure in the early stage, and the disease may be mistaken for rheumatism and disease of the spine, and the pain in the abdomen has simulated disease of the kidneys, renal calculus, and simple colic, and sometimes the symptoms are so slight as to lead to the nature of the case being overlooked altogether. Dr. Habershon describes the diagnostic characters by which abdominal aneurysms may be distinguished from several functional and other diseases affecting the abdomen, the most difficult case, perhaps, being where a tumour or enlarged gland presses upon the aorta, and thus communicates pulsation.

The most frequent *cause* of aneurysm of the abdominal aorta is excessive muscular exertion, the employment of the patient being of a laborious kind, or the disease is directly attributable to a sudden strain of the abdominal muscles, or to a blow.

The *duration* of abdominal aneurysm sometimes extends over several years, but after the onset of severe symptoms, it is rare for life to be prolonged for more than eighteen months, or two years, and after the formation of a manifest pulsating tumour, with severe and paroxysmal pain, the majority of patients die within three months.

As for the *treatment*, very little can be said. The plan recommended by Valsalva has long fallen into disrepute, and the only measures to be recommended are the administration of sedatives, with gentle aperients, the use of a light but nourishing diet, and the maintenance of rest.

Dr. Habershon concludes his paper with the details of sixteen cases, most of which were instances of aneurysmal tumours; but some of them were not of that nature, although the symptoms might have led to mistake. In one case, which was very obscure during life, the disease was found to consist of an abscess about the pancreas, causing pressure on the aorta, so as to communicate a pulsatory thrill, and on the duodenum and the pylorus, so as to cause obstruction and excessive vomiting. In this case, various morbid conditions suggested themselves to account for the symptoms during life, as gall-stone, cancerous disease or ulceration of the stomach, or of the transverse colon, aneurysm, disease of the pancreas, or of the glands in its neighbourhood, and local suppuration.

III. *The Stereoscope and Stereoscopic Results.* By JOSEPH TOWNE.—This paper is a continuation of a former communication published in the Reports, and is only intelligible when taken in connexion with it. The object of the writer is to show that the stereoscope cannot be regarded as the exponent of ordinary vision, in which physiological as well as physical phenomena are concerned, but that the instrument affords facilities for further inquiry in connexion with the physiology of binocular vision.

IV. *The Stereoscopic Test for the Retinæ.* By JOSEPH TOWNE.—In this paper, the principles enunciated in former papers in reference to the functions of the eye, and the construction of the stereoscope, are brought to bear upon the diagnosis of ophthalmic diseases. In a healthy condition of the eye, the appearance of external objects is the same in both retinæ; but when the retinæ are in any way diseased, the same object will present different appearances in each. The test now proposed, and which is explained in a series of diagrams, is the presentation to each eye in succession of a series of objects prepared for stereoscopic vision, and consisting of two halves in each case. Supposing the retinæ to be perfectly healthy, these halves would coincide and form one distinct and symmetrical object, but if the retinæ are in a morbid condition, then the parts of the object are distorted, or dislocated, or obscured. The affections in which this test would be applicable are thought to be those forms of blindness, or partial blindness, which are unconnected with any visible change in the retinæ, and which would, therefore, be inappreciable by the ophthalmoscope; such are the results of paralysis, more or less complete, affecting the whole or parts of the retinæ. Several cases are given in illustration, but it is impossible to explain them without the aid of the diagrams which accompany the paper.

V. *Case in which a large Quantity of Nitrate of Potash was taken Medicinally. Elimination of this Salt by the Urine. With Remarks.* By Dr. WILKS and Dr. ALFRED S. TAYLOR.—It is generally admitted that the alkali potash is ordinarily eliminated in healthy urine in the form of sulphate; but this rule is of course interfered with when special salts of the alkali, such as the iodides and bromides, are taken medicinally. In the case now recorded, large doses of nitrate of potash were administered to a patient who had suffered from renal dropsy, but was recovering; and the objects in administering the salt were to promote diuresis, and moreover to ascertain, by careful examination, the mode in which the potash was eliminated by the urine. Healthy urine contains a known proportion of potash, 1000 grains yielding, according to Berzelius, 3·71 grains of sulphate of potash, equivalent to 2 grains of potash; and in Dr. Wilks's and Dr. Taylor's case this normal proportion of potash was of course taken into account in determining the results of the experiment. Between October 28th and December 26th the patient took, in divided doses, one pound twelve ounces and six drachms of nitrate of potash, and the question to be determined was the mode in which the salt had been discharged from the system. On evaporating the urine to an extract, distinct evidence was obtained of the existence of nitrate of potash, by observing the deflagrating properties of paper dipped in the extract and dried. Crystals of nitrate of potash were also obtained by spontaneous evaporation, and were identified by their prismatic character under the microscope, and their property of dissolving gold-leaf when mixed and heated with pure hydrochloric acid. The result was that in every twenty-four hours 158·7 grains of nitrate of potash were discharged, while the patient was taking 270 grains of the salt in the same period, leaving more than 100 grains to be accounted for. Some of the potash may have probably passed away in combination with sulphuric acid and chlorine, but very much of it was no doubt carried out of the body by the intestines.

Nitrate of potash is unquestionably an irritant poison, but in the case above related it was given in divided doses, so as to afford ample time for its elimination by the bowels and urine, so that it produced no injurious effects. In a period of fifty-nine days the patient took a quantity of nitre amounting to twenty-eight fatal doses, and if he had taken in a single dose the quantity which was spread over every two days, there is reason to believe that the result would have been fatal.

VI. *On the Cooling of the Human Body after Death. Inferences respecting the Time of Death. Observations of Temperature made in* 100 *Cases.* By Dr. ALFRED S. TAYLOR and Dr. WILKS.—The questions involved in this paper are of very great interest in a medico-legal point of view, but hitherto they have not been solved in a trustworthy manner, and medical opinions have been offered in merely a speculative way in cases where accurate knowledge is indispensable. With the view of affording more accurate data than we at present possess, the authors of the present communication have collected the particulars of 100 cases of deaths in Guy's Hospital, recording the age, the cause of death, the time of death, the temperature of the air, as well as its hygrometric condition, and the temperature of the body at one or more intervals after death. The temperature was taken by placing the naked bulb of a good thermometer uncovered on the skin of the abdomen. If after two or three days much change should be present in the body, it is generally to be attributed to some peculiarity in the cause of death, and, as a rule, the bodies of those who have been long ill and are emaciated remain unchanged for a longer time than those who have died of acute disease; and it is also observed that the bodies of persons who have been killed while in good health often undergo rapid decomposition.

The observations on the temperature of the bodies are recorded in a tabular form, and the results are interesting, and in some instances paradoxical. Thus in one case the temperature of the body of a man who died from Bright's disease *increased* 3°, although the temperature of the dead-house was 42°, and in six hours afterwards it returned to 72°, which had been observed two hours after death. The coldness of the adult human body is rarely complete till after the lapse of *fifteen* hours from the cessation of life, but it sometimes cools much more rapidly, and the bodies of persons who have died from malignant cholera, phthisis, and other chronic diseases, have been found quite cold on the surface within *four* or *five* hours. The physical circumstances in which the body is placed will also influence the rate of cooling, as the medium in which it is immersed, as air or water, the temperature of the medium, the state of the atmosphere, the presence or absence of clothing, the nature of the material of which the clothing is made, and other particulars.

It is noticeable that mere coldness of the body is not incompatible with a continuance of life, for many morbid causes may suspend the production of heat in the living body; and, again, it appears from the evidence afforded by some well-attested cases that the warmth of the human body may be retained in its normal state for some length of time after death. Some curious information is given in illustration of this latter rather anomalous occurrence, and among other recorded cases, Dr. John Davy found that in one the thermometer rose to 112°, and in a second to 108°, although the temperature of the apartment was only 86°.

It is then shown that a knowledge of the time required for the cooling of the body after death has an important bearing upon many cases of suspected murder. Thus in March, 1856, a man and his wife were found dead in bed, and their bodies were covered with blood from wounds inflicted on both. The body of the woman was cold and rigid, and that of the man was warm, but the nature of the man's wound showed that he could not long have survived its infliction. It was therefore inferred from these and other concurring circumstances that the woman died first and the man some time afterwards, and the direction of the wounds on the woman rendered it probable that she had not committed suicide, and it was inferred that the woman had been murdered by the man, and that the man had afterwards committed suicide. In another case which happened in 1862, and in which a man was also accused of murdering his wife, the coldness and rigidity of the body of the latter afforded important evidence against the supposed murderer, who was proved to have gone out some hours before the body of his wife was discovered. On the part of the defence, however, it was urged that a woman, who had been with the deceased after the husband had left home, had really committed the murder; but if so, then the body must have cooled and become rigid in about four hours, a circumstance which is not consistent with known facts. The man was convicted of the murder and sentenced to death, but in consequence of the doubt still suggested in some quarters that the body may have cooled and stiffened in four hours, the capital sentence was commuted to penal servitude for life. Still, the opinions given by the medical witnesses were correctly formed as to the great improbability that the body could become cold and rigid in four hours.

VII. *On Tumours. Clinical Report.* By THOMAS BRYANT.—Mr. Bryant states that he does not intend in this paper to enter minutely into the pathology of new growths denominated tumours, but rather to indicate their diagnosis, and to point out the principal features by which one tumour may be distinguished from another. As a leading pathological principle, he starts with the view, "that all tumours, with the exception of the hydatid, are made up of one or more of the natural elementary tissues of the body, and that in no single example has any extraneous or new element ever been detected." Just as the natural body is made up of cells or fibres in some form, so tumours are made up of the same kind of elements, although it may be in unequal proportions. Hence, then, a second leading principle may be drawn, "that all tumours partake of the nature of the part in which they are developed, and are more or less made up of the elements which naturally enter into its formation." Thus a tumour developed in the stroma of a fibrous structure will probably be fibrous; if connected with a bone, more or less osseous; and if situated in a gland, it will in all probability partake of the glandular structure. With regard to the primary division of tumours, they are all

"either simple or cancerous, innocent or malignant; the simple or innocent approaching in their nature the more highly organized natural structures of the body, even to the perfect glandular; and the malignant or cancerous simulating the most elementary or embryonic; for as the normal tissues were formed from a simple cell, and those of a higher grade from its development, so the cancerous element is a simple cell, or the undeveloped embryonic nucleus."

In proportion, therefore, to the amount of the cell-element in a tumour may its cancerous tendency be determined, and the greater the proportion of its fibrous or well-developed structure, the greater is the probability of its being innocent or simple. Another fundamental principle is, that "tumours never change their original nature, nor pass on nor degenerate into others of a different kind. A simple tumour is simple to the end, and a cancerous tumour is cancerous from the beginning." But these lines are not intended to convey the impression that a patient who is the subject of a simple tumour may not become the subject of a malignant one, or *vice versâ*, for such may be the case; and after the removal of a simple tumour, a malignant one may make its appearance. Again, "simple tumours separate tissues in their growth, but never infiltrate; cancerous, as a rule, infiltrate, and rarely separate." Mr. Bryant insists upon the foregoing as a most important point in diagnosis; for a simple tumour, however long it may be in growing, or however large a size it may attain, will never do more than separate the parts beneath and between which it may be developed. The bones may be absorbed by its pressure, but they will never be involved, and the skin may be so stretched and attenuated by its distension as to ulcerate or burst, but it will never be infiltrated by the elements of the tumour. A cancerous tumour, however, for the most part freely infiltrates all the tissues on which it presses, and rapidly involves the skin if it is near it. Finally—

"Simple or innocent tumours affect the patient solely through their local influence, and have no tendency to multiplication in other tissues, nor to involve the absorbents with which they are connected. Cancerous tumours not only affect the patient through their local influence, but have a marvellous tendency to multiplication in any part of the body, more particularly in the internal parts, and never exist for any period without implicating the lymphatics of the part with which they are connected."

Having thus laid down his principles regarding the development of tumours generally,[1] Mr. Bryant proceeds to consider their different varieties, describing successively the sebaceous or steatomatous and epidermal tumours, the fatty tumours, certain forms of cystic tumours, cysts of the neck, cysts of the thyroïd gland, hydatid tumours, the fibro-cellular, fibro-plastic, and fibrous tumours, and the recurring fibroïd tumour. These latter possess all the characters of the fibro-plastic tumour, but they possess one of the features of the cancerous, in so far as they have a constant tendency to return, after removal, either in the same place or in the neighbouring parts. In the pathological chain of tumours they are therefore connecting-links between the innocent and malignant growths; but there is nothing very distinctive in their external characters by which they can be known. Microscopically, they possess more of the cell element than the innocent form, and the cells take on a caudate shape. After the recurring fibroïd tumour come the cancerous tumours, the first being epithelioma, or epithelial cancer, and then the true cancers. With regard to the much-disputed question as to the real nature of a cancerous tumour, Mr. Bryant observes that

"pathologically a cancerous tumour is not composed of any definite or characteristic elements, such as at once stamp it as being a cancer; it does not contain any distinct cancer-cells which mark its nature, for the cells, nuclei, and fibres which enter into the formation of a cancer may all be traced in other and

[1] In reference to this subject, Virchow's work on tumours, 'Die Krantschäften Geschwülste,' may here be alluded to.

in innocent morbid growths. It does not appear, however, to be incorrect to assert that the more the cell-element predominates in a growth, the greater is the probability of its being malignant, and therefore cancerous; for the soft cancers, which are undoubtedly the most virulent, are made up almost entirely of cells and nuclei, only enough fibre-tissue existing to bind and hold these cells together."

After alluding to the difficulties often experienced in distinguishing a simple from a malignant growth, in the early stages, and pointing out the chief diagnostic marks of both, Mr. Bryant sums up by observing:

"A distinct and isolated tumour, therefore, which does not possess any of the special characters of a simple growth, which is attended with some evidence of secondary affection or infiltration of the parts, and with which an enlargement of the lymphatic glands in its neighbourhood exists, may safely be regarded as cancerous."

The last kind of tumour described is the cartilaginous tumour, or enchondroma.

VIII. *Sebaceous Tumour within the Tympanum, originating on the external surface of the Membrana Tympani, Bands of Membrane occupying the Cavity.* By James Hinton.—The case was one which presented no aural symptoms during life, but the post-mortem examination exhibited the early stage of a very serious form of disease, which seldom attracts attention until far advanced. On opening the tympanum in the petrous bone of the right side, a small mass, of a brownish-red colour, and of about the size of a pea, was found situated just above and external to the head of the malleus, evidently in connexion with an aperture in the membrana tympani, and traceable into the external meatus. This mass looked at first like a tubercular deposit; but on further examination, it was found to be surrounded with a distinct, though thin, vascular membrane, and its contents consisted of small whitish flakes, analogous to those which are found in sebaceous tumours. Several cases of this kind occurring in the meatus, and proving fatal by extending through the bone, and setting up suppuration within the brain, have been recorded by Mr. Toynbee in one of the numbers of the 'Medico-Chirurgical Transactions.'

IX. *A Collection of Cases of Foreign Bodies in the Stomach and the Intestines.* By Alfred Poland.—Mr. Poland's object in making this collection of cases is to ascertain whether it is possible to detect foreign bodies in the bowels, and if so detected, whether they can be justifiably removed. He classifies his cases under three divisions, according as the foreign bodies occur in the stomach, in the small, or in the large intestines. Mr. Poland has not met with many such cases in his own practice, but he has found them recorded in medical works, and their present collection indicates very diligent research on his part. One of the most curious cases is that of the knife-eater, who died in Guy's Hospital, and whose case was recorded by the late Dr. Marcet at the beginning of the present century. This man was a sailor, who was alleged to have swallowed, for a considerable period, a number of pocket-knives, some of which had passed away by the bowels, but others remained in the intestine, giving rise to dyspeptic and inflammatory symptoms. He first entered the hospital in 1807, under the care of the late Dr. Babington; but his story was not believed, and after some treatment by aperients and alteratives, he was discharged relieved. He was admitted again, however, in September, 1808, under Dr. Curry, and gradually sank until March, 1809, when he died in a state of extreme exhaustion. The post-mortem examination was made by Mr. Travers, and parts of the knives were actually found in the intestines and the stomach. In the stomach thirty or forty fragments of knives were found, thirteen or fourteen of them being evidently the remains of blades, some corroded and reduced in size, and others in a state of tolerable preservation; one of the back springs of a knife was found transfixing the colon, and projecting into the cavity of the abdomen, while another was found stretching across the rectum, with one of its extremities actually fixed in the muscular parietes of the pelvis. It was observed that, although the knives had thus perforated the intestines, no fæces had escaped into the cavity of the abdomen, and no active inflammation had taken place, owing, probably, to the fact that the perforation had been gradual, and that the parts had adapted themselves closely round the protruding instrument. Many other instances are given from British and foreign medical annals of knives having been swallowed, sometimes in sport and sometimes by accident, and in most cases the treatment was successful. Mr. Poland records also a number of cases, necessarily of a miscellaneous character, where foreign bodies have been found in the small intestines, the large intestines, and the appendix vermiformis, the latter being by no means an unusual, and often a fatal occurrence.

X. *Some Observations on the Iodic Test for Morphia.* By A. Dupré, Ph.D., F.C.S.—Dr. Dupré having frequently observed that students have failed to obtain the blue iodide of starch by the action of iodic acid on morphia, even when using larger quantities of the alkaloïd than are generally alleged to yield the desired result, has examined into the circumstances most favourable for the successful application of the test. The precautions necessary to ensure success are, a careful preparation of the iodic acid, dissolved in a definite quantity of water, and an equal care in preparing the starch, and boiling it in a definite amount of water. Other details are given in relation to the application of this test, but they are of a very minute and purely technical character.

Review VIII.

1. *Reports on the Nature of the Food of the Inhabitants of the Madras Presidency, and on the Dietaries of Prisoners in Zillah Jails.* Compiled and arranged, under the orders of Government, by W. R. Cornish, Secretary to the Principal Inspector-General of Medical Department.—*Madras*, 1863. pp. 140.
2. *On Sufficient and Insufficient Dietaries, with special Reference to the Dietaries of Prisoners.* By W. A. Guy, M.B. Cantab., F.R.C.P., &c. (Reprint from 'Journal of Statistical Society,' vol. xxvi.)—1863. pp. 280.
3. *A Manual of Diet and Regimen for Physician and Patients.* By H. Dobell, M.D., M.R.C.P., &c.—*London*, 1864. pp. 36.

The subject of dietaries, at all times interesting, yet often too much neglected, is especially deserving of attention at present, now that the Government authorities, as it is understood, are collecting evidence with a view to prepare a uniform scale for use in all our prisons.

We propose to notice the several publications which constitute the heading of this article in the order in which they are given, and with the hope of making our readers acquainted with juster views than have commonly prevailed relative to the kind and quantity of food which, under a just economy and a due regard for average health, should be allowed to those who are sentenced to imprisonment as a punishment.

1. *Of the Madras Reports.*—These consist of three parts, forming a very comprehensive and valuable whole—indeed, we may say, a model of the kind. The first part is by the able secretary, Mr. Cornish, in which is embodied the general results derived from an examination of the Reports of the many medical officers in charge of jails in the Madras Presidency. These Reports, thirty-one in number, of various lengths and value, constitute the second part of the work. The third and concluding part is a Report by the Chemical Examiner to Government, J. Mayer, Esq., made, at the request of the Inspector-General of Hospitals, on Dietaries, in reference to the relative proportions of heat-giving and formative or reparative materials, which, though the shortest, is not the least valuable portion of the whole.

In designating these Reports as a model of their kind, we are barely doing them justice. It is seldom that in so few pages we have found so much information, and that so varied and apparently reliable. Of all countries, India is specially adapted for inquiry relative to the food of man, where, owing to the different religions of the population and the different castes, the diets of the people, according to their religions and castes, are varied and distinct, so much so, indeed, that were it an object of the physiologist to institute experiments on the subject, he could hardly imagine any so much to be depended on and so fruitful of results as those already made, and with the special advantages attending them of the fixed habits of the natives and a regularity of mode of life, which we should seek for in vain in Europe, where man is less shackled by custom and lives under a freer regimen.

Mr. Cornish, in his Report, besides making a general statement comprising the results of the individual inquiries, affords much information of a supplementary kind relative to the geographical features of the country—its climate and its influences, and the natural productions of the soil. In the very first page he points out a popular error amongst us, and one that the late Mr. Buckle made in his attempt to explain the influence of physical laws on the characteristics of nations—viz., that the whole of the inhabitants of India are rice-eaters, and that rice is the most nutritive of all the cerealia. Instead of which, as Mr. Cornish demonstrates, rice is less nutritious than any other, as it contains the smallest proportion of nitrogenous matter, and is used chiefly on the sea-board, where the climate and means of irrigation are most suitable to its growth and cultivation. Now, this rice-growing region is a small portion of the whole of Hindostan; over a far greater extent, other kinds of grain are the predominant crops; in Northern India and the Deccan, wheat; in Myzore, razzy (*elusine corocana*); in the interior of the Madras Presidency, the latter grain, with cholum and cumboo (*holcus sorgum* and *holcus spicatus*); and where these are grown, these grains are most used, especially by the labouring class, rice there being rather an exceptional article of diet, and confined to the tables of the more opulent. The following table, formed from the analysis of Mr. Mayer, shows the composition of these four kinds of grain :

	Nitrogenous ingredients.	Non-nitrogenous.	Inorganic.
Razzy	18·12	80·25	1·03
Cholum	15·53	83·67	1·26
Cumboo	13·92	83·27	0·73
Rice	9·08	89·08	0·47

Another opinion, widely entertained, is that the Hindoos are vegetarians. This, too, as Mr. Cornish well shows, is as erroneous as the preceding, inasmuch as those castes of natives who eat no flesh indulge freely in butter, milk and curds. The diet of the people generally is no wise simple: those who use vegetables most, use them in great variety, and many kinds of grain besides those mentioned, and a great variety of fruits and condiments. Our restricted limits do not allow us to enter into particulars; for these we must refer to Mr. Cornish's Report, which will well repay the perusal. Of the different races we may briefly remark that the Mussulmans indulge most in animal food, pork alone being excluded from their dietary. Next to these, as regards this indulgence, are the lowest castes of Hindoos and the outcasts, the former refusing only beef; the latter not even beef or carrion. It is curious to see how, whatever the prevailing diet may be, it is so mixed and modified as to be tolerably wholesome, and in no small part owing to the many correctives afforded, brought into use, as it were, almost instinctively. Curries are the favourite dishes of all classes, and in them the correctives are most displayed.

As regards the influence of diet on the health, strength, and intellect, there seems to be satisfactory evidence in the Reports that those races, such as the Mahometans, who use a mixed diet in which animal food constitutes a considerable proportion, are the healthiest, strongest, and most energetic; and, on the contrary, that those, such as the highest class of Brahmins, who abstain from meat, and live principally on rice with milk, curds, and ghee, and sweetmeats, are the least active and energetic, and most prone to disease, and shortest-lived. Cunning, the resource of the feeble, is one of their mental characteristics. Intermediately, perhaps, may be placed those races who depend chiefly for their support on the more nitrogenous grains, indulging, as much as their means permit, in meat and fish. These are chiefly of the labouring class, who are spoken of in many instances as well grown, robust and healthy.

Mr. Cornish, in that part of his Report which he devotes to "the philosophy of food," well points out another error, one often committed by professed writers on dietetics—viz., that in warm climates, such as that of India generally, a vegetable diet—one rich in the hydrocarbons, the special heat-producers—is most needed. How illogical such an opinion is, we need hardly remark. The high caste Brahmin affords a practical example in proof. He is described as intolerant of heat, as clad in the lightest garments, unable to sustain European clothing, as avoiding all business during the heat of the day, when indeed he is unfit for any exertion, drowsy and oppressed as he then is. Other proof is afforded in the fact that the natives who most use a vegetable diet are least able to withstand the effects of malaria, and are most subject to, and suffer most severely from, the fevers of the country. He further well points out that wherever exertion is required in India, bodily or mental, a good nourishing diet is essential, and cannot with impunity be dispensed with, whether in the instance of natives or of Europeans; and he is not the first writer who has laid emphasis on the fact that during a time of unusual exertion there has been an unusual exemption from one of the diseases of the climate—abscess of the liver—which, in the instance of our troops, he attributes in part to too rich and full a diet during a time of peace in cantonment, the men inhabiting darkened and ill-ventilated apartments. We quote a remarkable example which he gives of this exemption in the history of the Madras Fusiliers during the memorable campaign in Bengal of 1857–58. He says:

"The regiments for months together underwent the greatest amount of peril and hard work in field and garrison. War and pestilence played great havoc in the ranks of the corps; but with all the exposure to climate, changes of temperature, the excesses in eating and drinking, want of clothing and occasional scanty fare incidental to field service, there stands out the remarkable fact, *that not a single man died of abscess of the liver.*"

Mr. Mayer, in his scientific report, insists that the classification of food into the heat-generating and the plastic or restorative, is not, in strictness, correct, inasmuch as the great majority of the former contain the elements more or less of the latter, and the latter, by themselves, are capable of taking the place functionally of the former. Mr. Cornish insists on the same, bringing forward in proof the powerful carnivora almost peculiar to warm climates, and the many races of men in the same climates in Africa and America, whose food differs but little from that of the carnivora.

The main object of the Report, as is indicated by the title, is prison diet. In the prisons of the Presidency the dietaries vary considerably, both as to the articles included and their quantities. The aim of the authorities appears to be to establish one uniform scale, one founded on economy, without neglect of the health of the prisoners. Such a scale has been proposed founded on a principle in accordance with the composition of milk—a standard, as it may be considered, of diet—that the plastic material should be to the heat-giving in the proportion of about one to three. This, with some reserve, after a careful criticism by Mr. Mayer, is generally recommended, with the expression, however, of doubt, that the plastic proportion may be unduly high. His reasons for his doubt are cogent, and well deserving of consideration. He remarks:

"These proportions," as he thinks, "are too high, or I should say, unnecessarily high, as regards the plastic material: 1st, it is to be borne in mind that the standard taken (the best, no doubt) is one applicable to the young and growing animal, which requires a larger relative amount of plastic material than the full grown; 2ndly, the proportions of the plastic, compared with those of the heat-giving material, to be found in the cereals and leguminosæ, which (with some exceptions in the latter class) seem to be prepared by Divine Wisdom as a large portion of the food to be consumed by man, range from between one to four, and from one to seven; 3rdly, the proportions of these two kinds of food required to maintain health and strength, differ according to so many circumstances and conditions, that it would be most unphilosophical to lay down any absolute rules."

He further remarks:

"In a very cold country it is a well-known fact, that the inhabitants drink oil, and eat fats, to the extent that, to us, is disgusting to think of; they can also consume large quantities of alcoholic fluids almost with impunity, or at least, without suffering to the same extent that those do who live in warm latitudes. The reasons for these peculiar wants and capabilities are obvious: there is an excessive demand, on account of the low temperature of those regions, for heat-giving material, and therefore the consumption of oil, fat, and alchol (alcohol?) which all powerfully assist in preserving the temperature of the animal at the normal standard, although everything else about him may be many degrees below the freezing-point of water."

He states, in conclusion:

"The legitimate inferences to be drawn from the facts given, as well as from a host of others that might be adduced, tend to prove that the highest dietaries should contain from two to three parts of heat-giving materials, combined with one of plastic, while the lower dietaries range from between four and seven heat-giving combined with one of formative or reparative material. In accordance with the principles which have here been traced out, by taking as a guide the proportions present in milk, and in those grains which appear to have been specially prepared for man's use, the medical officer will, it is presumed, at all times be able satisfactorily to regulate the diets of his patients."

Relative to the absolute quantity of food, Mr. Mayer declines to offer an opinion—and on most rational grounds—so just, that we think it right to extract them, with the hope that they may come under the notice of those gentlemen who are likely to have an influence in deciding on the dietaries for our prisons:

"Whether sixty or sixty-five rupees weight of grain, exclusive of condiment, be sufficient or insufficient for the generality of prisoners in this country, I will not presume to affirm or deny; but I have no hesitation in saying, that the question, if it is to be determined on scientific principles, cannot be disposed of in this manner. Careful observations, by means of the weighing machine, as well as determinations continued through equal periods of time on the amount of urea (the representative of the tissues that have been disintegrated) passed out of the system daily require to be made, as well as determinations of the carbonic acid expired through the twenty-four hours, in order to form a just estimate, or even an approximation to an estimate of what is going on in the human organism, while living on any particular diet. It appears obvious that as one person's frame is much heavier than another's; that as one man's tissues are much more developed and pronounced than another's; that as one man's pulse is fuller and quicker constitutionally than another's; that as one man's digestion and assimilative powers are much greater than another's; that as one man's vital actions generally are more rapid than another's; that as one man's activity is much greater than another's; and that, consequently, there is constantly a greater disintegration of tissues, there must be greater requirements in such instances; and if this be true, it is not easy to understand how one uniform scale can be universally applicable."

We have mentioned more than one popular error which is exposed in these Reports. Another we have omitted—viz., that the natives of India abstain from all intoxicating drinks. This is shown not to be the case, some kind of inebriating drink being in common use, though rarely abused. And we are pleased to see that the editor of the Reports is decidedly of opinion that these drinks with coffee, and even opium and tobacco, used in moderation, are rather beneficial than injurious, as exercising a tranquillizing influence, and checking disintegration of tissue, under the prompting of an almost instinctive feeling.

We must not leave these Reports without an expression of the satisfaction we have had from their perusal. They are creditable to those who have contributed them, and to the Government which has called for them; and considering that their authors are all of the medical department, with the exception of the able chemist (if he be an exception), we cannot but feel elated by the ability and science displayed by them.

2. *On Sufficient and Insufficient Dietaries.* — This is a valuable paper, not less so than the preceding; and it is curious to see how similar is the treatment of the subject in both, and it is satisfactory, also, to find a close accordance in the conclusions arrived at, and this without any communication, and under external circumstances so widely different.

Dr. Guy, in his brief preface, describes his paper as comprising the evidence which he had submitted to the Commissioners on Penal Servitude and Prison Discipline, with much additional matter, especially in the form of diet-tables given for the sake of comparison.

After adverting to the difficulty of apportioning diet to different classes of prisoners, keeping in view the fact that it should minister to their correction by being unattractive and monotonous, and that it should be as economical as possible; and after further adverting to the anomaly that has arisen from an idea or hypothesis that prisoners require a diet more substantial than that of the rest of the community, he, like Mr. Cornish, enters on the science of the subject. Guided by the same principle in considering milk as a typical standard of food, he presumes that the plastic, the nitrogenous elements, should be to the respiratory material in about the proportion of 1 to 3. He gives the following table for the purpose of showing the composition of the cereal grains in common use, which after the weaning of the child constitute the most common food of man in Europe, and which may be viewed as the substitutes, and with slight differences as the equivalents, nearly, of milk:—

	Plastic.	Non-nitrogenous (calculated as starch).
Milk (human)	10	40
Wheat flour	10	46
Oatmeal	10	50
Rye meal	10	57
Barley meal	10	57
Milk of cow	10	30

The differences he points out, and shows how they may be corrected by certain additions: in the instance of wheaten bread, to which he thinks the preference is due amongst the cereals, he proposes to add a certain quantity of treacle to augment the sugar element, and a certain quantity of Indian meal to augment the oil element. "A bread," he says, "might thus be produced which would prove at once nutritious and economical, and form the nearest convenient approach to the composition of human milk." He adds, "On bread of this composition prisoners under punishment might, I think, be confined for a longer period than at present; and if the element of a free acid were added in the form of the potato, this period might still further be extended." This seems to us a just view, and we agree with him that the flour of which the bread should be made ought to be that of the entire grain (decorticated), the bran (minus the outer pellicle), of course, included. The addition of an acid he advocates on the ground that the milk of animals so soon becomes acid, and we would remark, is so wholesome in its acid state. The Caffres, a milk-supported people, are, we are informed, prohibited the use of sweet milk. Another argument in favour of the acid element we would mention, may be found in the fact that the yolk of the egg of the common fowl, and indeed of the eggs of all the birds we have examined, is acid. Treacle too contains an acid, and to it in part its good qualities may be owing.

Quantity, as to food, next comes under the author's consideration. On this point he quotes the experience of an eminent German physiologist, Vierordt, who from numerous and exact experiments on himself, keeping an account of the ingesta and egesta, came to the conclusion that about 4 ounces of albuminous matter, nearly 3 ounces of fat, and about $14\frac{1}{2}$ ounces of amylaceous food daily, are required to keep the adult male in good condition. Taking this estimate as a standard, he proposes several dietaries, variously compounded, with meat and without meat. We shall quote only the last which he submits, roughly based on the scientific formula. It is formed of—Bread, 1 lb.; potatoes, $\frac{1}{2}$ lb.; oatmeal, $\frac{1}{2}$ lb.; milk, 1 pint.

Proceeding with his inquiry, he next passes in review the "teachings of experience," which are eminently instructing. We must refer our readers to his paper for the particulars, and especially for the dietaries of the several prisons and workhouses which he introduces, compares, and comments on, these widely different both as to the articles constituting them and their quantities. Two dietaries have his special consideration—those of the Penitentiary at Millbank, and of the Pentonville prison—and this for particular reasons.

At the former the prisoners suffered to a considerable extent from dysentery, diarrhœa, and scurvy, amounting to an epidemic after a change of dietary in 1822, ordered by the Managing Committee, from one which seemed more than ample, the prisoners using it becoming plethoric, to another of a reduced kind. The table showing the change and the present ordinary diet, we give on account of the important information which it affords, omitting the column of diet proposed by the medical officer of the prison, that not having been tried:—

	Original dietary.	Dietary of the committee.	Present ordinary dietary.
	Oz.	Oz.	Oz.
Bread	168	168	154
Boiled beef	24	Nil.	35
Potatoes	112	Nil.	112
Total solid food	304	168	301
	Pints.	Pints.	Pints.
Broth or soup	8	14	$3\frac{1}{2}$[1]
Gruel or porridge	14	7	7
Cocoa	—	—	$5\frac{1}{4}$
Total liquid food	22	21	$19\frac{1}{4}$

In the Pentonville prison in 1842–43, certain experimental dietaries were instituted, formed on a very liberal scale, superior to those of "the Unions," expressly for the purpose of determining the most suitable diet for prisoners under solitary confinement in a building in a salubrious site, with the utmost attention to sanitary requirements; in this last-mentioned respect free from an objection which might be made to the Penitentiary at Millbank, on account of its unhealthy situation. These dietaries, five in number, Dr. Guy examines and

[1] "This is little more than the liquor in which the meat is boiled. But the broth or soup in the dietary of the committee was scarcely more nutritive for it contained less than one ox-head in one hundred pints."

comments on, and on the weight of the prisoners whilst using them as to loss or gain—this the commonly received test as to the effect of any particular diet, whether adequately nourishing or the contrary. The conclusions he arrives at are different from what might have been anticipated, and are very important—viz., that weight alone is not a just test, and that though commonly there is some increase of weight with increase of quantity of food, the relation is apt to be seriously disturbed by other causes, patent or obscure, known or unknown; and further, he shows by some carefully made trials, that "there are great and constant fluctuations in short intervals of time in the weights of men whose diet, occupation, and mode of life remain unchanged; and also that men who are differently occupied, though fed on the same food, and in other respects similarly treated, differ from each other in the order as well as the degree of fluctuation in weight." Our limits do not allow of our giving the details of the trials; they are very deserving of being consulted. From the results, as expressed in his conclusions, they seem to him—and we are disposed to agree with him—that the experiments at Pentonville for determining the best quality and proper quantity of prison-diet, were a failure, so leaving the question unsettled.

Advancing further in his inquiry, after considering mixed dietaries in most of which meat forms a component part, he brings under notice dietaries from which meat is entirely excluded. Of this kind is the dietary of the House of Correction at Devizes. It consists per week of bread, 196 ounces; potatoes, 112 ounces. Total of solid food, 308 ounces, and gruel 7 pints.

"On two days in the week a vegetable soup was substituted for the potatoes; but there was no meat whatever in this dietary, and no milk, or other animal matter. Nevertheless the Governor was able to report that this dietary agreed with the prisoners, that no loss of strength was noticed, and that no prison could be more healthy. And he added, 'There is not now, nor has there been any case of scurvy.' It should also be observed that this exclusively vegetable diet, having been adopted in an English prison, must have been strange to most of the inmates, who, before they became prisoners, had doubtless been able to procure more or less of animal food and meat. The prisoners had been kept on this diet for various periods up to eighteen months—many of them for six months or more. Two hundred and ninety-two prisoners, in various groups, were weighed on entering and on leaving the prison. Of 38 prisoners thus weighed after periods varying from two weeks to six months, 27 were found to have gained, 2 to have lost, and 9 to have neither gained nor lost. The average gain in weight was 3 pounds. Two other prisoners, after eighteen months, had gained on an average 6 lbs.; and 20 prisoners, confined for twelve months, had gained at the end of that period 5 lbs. on the average. Four other groups of prisoners, confined during six months, three months, two months, and one month, respectively gained, on an average, 3 lbs., 3 lbs., 2 lbs., and 2 lbs."

"Here, then" (Dr. Guy very properly comments), "we have in favour of a bread, potato, and gruel diet the most conclusive evidence. There was no loss of strength, an excellent state of health, no scurvy, and a most satisfactory addition to the weight of the prisoners. It should also be observed that there were among the prisoners several whose terms of imprisonment were sufficiently long to severely test any dietary."

We have thought it right to make this long quotation on account of the importance of the facts which it makes us acquainted with, and which would suffer in force from abridgment.

Dr. Guy next brings under notice dietaries in which, with the exception of milk, no animal matter enters, and yet appear, from the reports on them, to be satisfactory. Of two tables of this kind given, one for military prisoners in solitary confinement, the other for the penal class of prisoners in Millbank Prison, we shall quote only the last. It consists per week of

Bread	84 ounces.	
Oatmeal	70 „	
Indian meal . . .	70 „	
Potatoes	56 „	
Total solid food .	280 „	with $10\frac{1}{2}$ pints of milk.

Of the sufficiency of this dietary he says:

"Not merely for prisoners undergoing short terms of imprisonment, but those who are in close confinement and under punishment for many months together, I am able to furnish the most convincing proofs. This dietary was favourably reported upon by my predecessor, Dr. Baly, in 1858, and in my report for 1859. It has stood the test of both experimental weighings and of more general observation of the state of health of the prisoners; and I have recently had occasion to report cases of men whose health has been maintained on this diet for seven, nine, eleven, fourteen, fifteen, seventeen, and eighteen months; and cases of women similarly kept in good health on a similar diet for nine, ten, eleven, fourteen, and eighteen months."

He adds:

"I have no hesitation, then, in expressing my opinion in favour of the sufficiency of a dietary from which the meat element is wholly excluded. I have no doubt that health may be preserved, and with it the capacity for labour, on a diet consisting of milk and vegetable food; and I should have no hesitation in prescribing for all criminals under short terms of imprisonment a diet consisting wholly of bread and potatoes. I think that the experience acquired in the Devizes House of Correction, at Stafford and at Glasgow, would be a complete justification for such a dietary."

Incidentally, he discusses the cause of the outbreak of scurvy and dysentery which occurred at Millbank in 1823, and arrives at the conclusion that the main cause was not a diminution of the meat element, but *the abstraction altogether of the potato element*—a conclusion which was strongly inferred by Dr. Baly from other facts.

Before concluding, the author treats of "existing prison dietaries," premising that there are two classes of prisoners to be provided for—those for a short period, and those for a long period. Relative to the dietaries for the latter, he shows, as we think, clearly, that with much incongruity, the diet ordered has always been in excess, especially in the convict establishments, Pentonville, Wakefield, Millbank, Portland, Portsmouth, Chatham, and Dartmoor, and most of all at the last four. At Dartmoor, the total solid food, consisting of bread, potatoes, meat, suet-pudding, is 348 ounces per week; and the total liquid food, consisting of soup, gruel, cocoa, milk, tea, molasses, is 17 pints; the total of solid food at Pentonville being 280 ounces; at Wakefield the same; at Millbank 301 ounces; at Portland 331 ounces; at Portsmouth and Chatham 340 ounces. The total liquid food the same at all of them.

One reason assigned for these ample dietaries, greatly in excess of the allowances to which the working class generally restrict themselves, is, that prison-confinement is naturally depressing, and requires to be counteracted by a superior diet. This idea the author controverts, on two grounds: one that, if depressing, the digestion will not be improved, and that excess of food in that state must be injurious rather than beneficial; the other that, generally speaking, taking the average prisoner, he is not mentally depressed, experience proving that he soon accommodates himself to the circumstances, and that living much at his ease, with a large allowance of sleep, with no cares, sufficiently clad, well taken care of, secured from cold and the inclemencies of the weather, with moderate exercise—for such commonly is what is designated hard labour—his bodily waste, the disintegration of tissue, is not in excess, and a higher diet is a mistake.

As showing the incongruities of dietaries, we must quote what the author says of those of Portland, Portsmouth, Chatham, and Dartmoor.

"Of these," he remarks, "it is impossible to give any rational account. The strongest and most robust prisoners are sent to Portland; those who are less vigorous and robust to Portsmouth and Chatham; and those who are fit only for light labour to Dartmoor, to which place also are sent the maimed, crippled, and deformed, the scrofulous and consumptive, and men of weak minds. And yet the dietaries of these three prisons, all largely in excess of Pentonville, and even of Millbank, seemed to be framed in a spirit of contradiction. The robust prisoner at Portland gets less food than the less vigorous inmate of Portsmouth and Chatham; and this last gets less than the most effective of the invalids at Dartmoor. But ample as the ordinary diet at these convict establishments is, it has not been deemed sufficient for the whole period of confinement, for the tables of 1857 add an increased diet in the case of Portland, and in all the prisons additions to the dietaries for men in the third and fourth stages."

A table is given showing the increase, from which it appears that for the fourth stage, at Portland, the total solid food is increased per week from 331 ounces to 392 ounces; at Portsmouth and Chatham, from 340 ounces to 353 ounces; and at Dartmoor from 348 ounces (hard labour) to 354 ounces, with some increase of liquid food, and a small addition of beer or porter.

Dr. Guy, for reasons which he assigns, attaches much importance to the dietary history of Millbank Prison. He speaks of it as

"the centre of a cautious and timid policy in matters of diet, and the cause of unnecessary expenditure, of which the amount may be guessed at by the aid of an assertion which I believe I am justified in making, that the extra supply of bread retained in consequence of this alleged unhealthiness of the site, and the changes made in 1854, during the prevalency of the cholera, have cost the Government, on an average of cheap and dear years, not less than £1000 per annum."

The results of the author's inquiries are given in twelve propositions, forming the conclusion of his very interesting and instructive paper. We are induced to extract them on account of their importance, believing that they are founded on accuracy of observation and soundness of reasoning.

"1. That though the elementary constituents of a wholesome and nutritious diet, and the articles of food which yield them, are ascertained with sufficient accuracy, the quantity of food required to support any body of men in health and efficiency is not, and cannot be, precisely determined.

"2. That the difficulties which attach to the selection of dietaries adapted to the peculiar conditions and circumstances of different bodies of men, make themselves felt to an extreme degree in the case of prisoners.

"3. That the very circumstance of large bodies of men, differing widely from each other in age, constitution, and occupation, being supported, in apparent health and vigour, on the same dietary, proves conclusively that food may be taken in excess of the real wants of the frame, without producing effects which shall attract the notice of even the most careful and watchful observer.

"4. That we possess no conclusive tests of sufficient or insufficient dietaries, and that the test of weight, which is the most precise, cannot be safely applied till we have obtained more accurate information than we now possess respecting the causes, other than food, which affect the weight of the body.

"5. That the value of the experiments made at Pentonville Prison in 1842 is impaired, partly by the want of this information, and partly by the want of scientific exactness.

"6. That we possess conclusive evidence of the sufficiency of a diet from which meat is wholly excluded, and even of a diet consisting entirely of vegetable matter; that such a diet would probably suffice for able-bodied paupers, and even for prisoners sentenced to hard labour, and for convicts employed at public works; and this is true of men previously accustomed to animal food.

"7. That the potato is an important element in our dietaries, and that its omission has probably been the true cause of outbreaks of scurvy, which have been attributed to a mere reduction in the quantity of food.

"8. That the existing prison dietaries present many curious anomalies very difficult of explanation, except on the supposition that additions made for temporary reasons, such as a wish to satisfy the importunities of prisoners, or a transitory departure from health, or outbreak of disease in a small section of the prisoners, have become permanent through inadvertence or from aversion to change.

"9. That the dietaries of our county prisons, for periods exceeding four months, and all the dietaries of our convict establishments, are greatly in excess of the dietaries of able-bodied paupers, and probably in excess of the requirements of the prisoners themselves.

"10. That our prison dietaries have been framed under the influence of an exaggerated estimate of the depressing effects of imprisonment, and of an opinion, probably ill-founded, that the physical effects of such depression can be counteracted by increased supplies of food.

"11. That our prison dietaries have also been framed under the influence of a timid feeling, originating in misconceptions as to the true cause of the epidemic of Millbank Prison, but especially in the belief that it was due to a reduction in the quantity of food.

"12. That some reduction in the dietaries of our convict establishments might be made with safety and economy; and that further reductions would probably be justified by well-devised experiments."

If additional arguments were required for making the potato an invariable element, if not the chief ingredient of prison dietaries, the experience we have in Ireland might be adduced, the working population of that country, when subsisting almost entirely on this vegetable, having enough of it, being remarkable for health, strength, fecundity, and length of life. As to an exclusive vegetable diet being compatible with the health and strength of ordinary labouring men, the proofs are ample — especially with the addition of milk, not omitting salt.

The preceding propositions, important as they are, are assuredly deserving of the attention of the authorities concerned in regulating the dietaries of all bodies of men who are not free to choose individually for themselves. The more practicable of the inferences, though specially applicable to persons under prison-constraint, may, we are disposed to think, be extended to another description of persons—viz., pauper-lunatics, who at present in palatial asylums, on a high rate of diet, are kept at so great a cost—a cost more than double that of those inhabiting the union workhouses. The plea for a high rate of diet, and a considerable proportion of animal food in these cases is, that the insane require a more generous diet than the sane. This, we think, is questionable; but even granted that the acute and curable cases may need such, or rather, we would say, a diet of the kind most likely to promote their recovery—the kind having to be determined —they, it should be kept in mind, are comparatively few, the far larger number of the inmates of county asylums being chronic cases, and hopelessly incurable. These constitute the class for whom, we think, a vegetable diet would be appropriate, apportioned in sufficient quantity and with some variety. We recommend this subject to the Commissioners for their consideration, inasmuch as without their approval no change of diet can be made, and with the persuasion on our parts that the alteration might be effected with perfect security as to health, a certain economy as to expenditure, and this without any sacrifice of comfort—the latter especially, taking into account that before the invasion of their mental malady, the majority of these insane, belonging to the labouring class, were accustomed to a diet which was chiefly vegetable. We may add that in those parts of Ireland, the south and the west, Kerry and Connaught, where the potato is most used, there, according to the census, the proportional number of the insane is lowest.

3. *A Manual of Diet and Regimen for Physician and Patient.*—This is a work of a very different character from either of the preceding. The author abjures theory, and yet, as well as we can judge, he makes no small use of it. Thus, in the table which he gives of the proximate composition of various articles of food, "plastic" is made to represent the so-called protein compounds, such as muscle, casein, and albumen; and "saccharine," we must infer, is made to stand not only for the different kinds of sugar, but also for the different kinds of starch.

We are assured by him of the accuracy of his tables, yet when we come to examine them we find instances which, as regards accuracy, must be considered as defective. We select a few. Butter is stated to consist of 100 fat, implying that it is entirely of fat without any water or other ingredients;[1] new milk of 50 plastic matter, 3·5 fat, 4·2 saccharine, ·6 mineral, 86·7 water; skimmed milk of 2·8 plastic matter, 3·5 saccharine matter, ·8 mineral matter, 92·9 water; buttermilk of 3·7 plastic matter, without any fat, saccharine, or mineral matter. The incongruities which these figures show we need not particularize.

For real practical use, we are of opinion that much more elaborate tables are required of articles of diet, and minuter distinctions. Take the egg as an example. According to the statement given, the white and the yolk differ chiefly in the one containing a less proportion of plastic matter than the other, and no fat, conveying, of course, the idea that in nutritive quality the substance of the white is identical with that of the yolk, minus the fat, whilst in truth they are different.

The table of wines, &c., or, as it is called, the "Alcohol table," is open to the same remark. The alcohol is undoubtedly an important ingredient, but it is not the only one; besides it, and the extract which all wines yield more or less on evaporation, there is a something on which their aroma and peculiar effects—comparing one wine with another—of hardly less importance, and medically considered, we are inclined to think, of equal importance.

Generally speaking, we must confess that we are no admirers of Manuals; they are commonly unsatisfactory and often hazardous, attempting more than it is possible they can perform, and too apt to inspire confidence not founded on exact knowledge. Bacon calls epitomes barren: the term is applicable to several manuals currently used in the profession.

A work on diet, to be truly useful, requires discrimination in no small degree; differences, even though small as to effect, being of more import than resemblances.

If it be difficult, as must appear from the foregoing pages, to determine the most suitable diet as to kind and quantity for prisoners, how much more so must it be to propound, with any prospect of success, in the form of tables, the diet of the sick! Those who have charge of hospitals know the shortcomings of diet-rolls, and how in all serious cases they require to be supplemented by *extras*.

[1] Butter such as that put on our breakfast-table, good of its kind, besides a certain portion of curd, contains at least eight per cent. of water. Both are variable, we need hardly remark, as to quantity, depending on the quality of the milk and the mode of making the butter.

Review IX.

1. *Hétérogénie.* Par F. A. Pouchet.—*Paris,* 1859.
Heterogenesis. By F. A. Pouchet.—*Paris.*

2. *Memoires sur les Corpuscules organisés qui existent dans l'Atmosphère.* Par L. Pasteur. ('Annales des Sciences Naturelles,' vol. xvi.)—*Paris,* 1861.
On the Organized Corpuscles which the Atmosphere contains. By L. Pasteur. ('Annals of the Natural Sciences,' vol. xvi.)

3. *Etudes Expérimentales sur la Genèse Spontanée.* Par F. Pouchet.
Experimental Studies on Spontaneous Generation. By F. Pouchet. ('Annales des Sciences Naturelles,' 1862.)

4. *Papers in the Comptes Rendus for* 1859–64. By MM. Pouchet, Pasteur, Joly, and Musset, Schaafhausen, &c.

5. *Journal of the Royal Institute of Lombardy.* ('Giornale dell R. Instituto Lombardo,' 1851, p. 467.) Communicated by P. Mantegazza.

6. *Sulla Generazione Spontanea note Sperimental.* Del Paolo Mantegazza.—*Milano,* 1864.
On Spontaneous Generation. By P. Mantegazza.

7. *Nouvelles Expériences sur la Génération Spontanée, &c.* Par F. A. Pouchet.—*Paris,* 1864.
New Experiments on Spontaneous Generation. By F. A. Pouchet.—*Paris.*

It is not our intention in the present paper to enter into the whole history of the speculations of physiologists on the subject of the spontaneous generation of living organism, a subject which has been one of the vexed questions of biological science from almost the earliest times, and which is even now, as we shall have abundant opportunity of showing, far from being finally decided. Any of our readers who desire such a history will find a good summary of it in the early chapters of the first two treatises which are named at the beginning of the article; and should they wish to go still further and deeper into the question, will find in the same place abundant references to original sources of information. All that we can attempt within our present limits is to give a *résumé* of the most recent experiments and investigations which have been undertaken, and to indicate the present position of the question. The long controversy in the last century between Needham and Spallanzani left the question in dispute much where it was before. For whereas it was made clear, by the experiments of these observers, that putrescible matter if boiled for a length of time in closed vessels could be preserved without alteration, it remained doubtful whether the somewhat rough process to which the experiment was submitted had merely killed the germs of organism contained in the vessel, or whether it had produced some such change in the constitution of the contained air as rendered it incapable of sustaining organic life. The latter of these views, though apparently the less probable of the two, obtained great credit from the support of Gay-Lussac, who found that the air in the "Conserves d'Appert" made by this process contained no oxygen.

Here, then, the matter was left until taken up by Schwann in 1837, and from that time till the present it has been the subject of constant experiment and research.

Schwann, with a view of removing the ambiguity which arose from the doubtful purity and questionable composition of the air contained in the vessels upon which he experimented, resolved to introduce fresh portions of air into them during the progress of the experiment. This he did by permitting the interior of his vessels to communicate with the external air by means of tubes maintained during the whole experiment at a temperature nearly equal to that of boiling mercury, a current of air being kept up by means of another tube, with an aspirator attached. On repeating this experiment, however, over a mercury-bath, side by side with similar ones to which air was admitted in its natural state, the results were not found to be free from ambiguity. Sometimes organisms made their appearance in both series of comparative experiments, sometimes in neither. The only real advance, therefore, made by Schwann towards the settlement of the question was the complete refutation of Gay-Lussac's assertion as to the part played by oxygen in the development of organisms or the process of putrefaction. These experiments were followed up by others conducted by MM. Ure and Helmholtz, whose processes were like those of Schwann; by Schultze, who passed the air through strong chemical reagents instead of the heated tubes; and by Schroeder and Dusch, who employed a filter formed of a large tube filled with cotton for the same purpose. All these observers, however, failed to get beyond the point to which the experiments of Schwann had led them. They all came to the same conclusion that there was "something" in the air besides oxygen, the presence of which was necessary to the production of putrefaction; but whether this "something" consisted of the germs of minute organisms, or of some gas or fluid, or of miasmata or what not, was a point which the respective partisans of "heterogenesis" or "pan-spermism" were left to dispute at their leisure.

But though, during this time, the results of investigation failed to support positively one or the other doctrine, there is no doubt that the general opinion of scientific men inclined to the latter of the two. The current of scientific progress seemed to have set uniformly in that direction; and from the time when Van Helmont gave directions for the manufacture of mice, and when people believed that maggots were spontaneously generated in putrid meat, each successive discovery—almost each successive observation—had served to confirm the view that every organism, of whatever kind, is the immediate product of a previously existing organism. Infusorial plants and animals alone now occupied the mysterious and unexplored realm of nature, in which it was still believed by some that organisms were constructed by the action of some undiscovered laws directly from matter which had formerly formed a part of some more highly endowed creature than themselves. Such was the state both of knowledge and of opinion when, in the year 1858–9, M. Pouchet of Rouen presented to the Academy a series of papers detailing observations and experiments, by which he professed to have demonstrated the existence of spontaneous generation as a fact; and the Academy, struck no doubt with the astounding nature of the discovery, proposed in 1860 as a prize subject—'Essayes, par des Expériences bien faites, de jeter un Jour nouveau sur la Question des Générations Spontanées.' It is with the investigations which have been undertaken since this time that we shall be mainly concerned in the remaining portion of this essay.

M. Pouchet, then, in the work whose title we have placed at the head of this article, appears as the professed champion of Heterogenesis, puts forward his views in a systematic and elaborate treatise, and supports them upon a basis of very extended and laborious experimentation. Having in the first three chapters of his work given a history of the previous progress of the question, and certain general views of the metaphysics of the subject, into which it is not our present purpose to enter, he proceeds in chapter four to give an elaborate experimental disproof of the theory maintained by the "Panspermists," as he calls them. This he does somewhat as follows. There are certain points on which all observers, or nearly all, are agreed; thus, all admit that in order to the production of infusoria the conditions required are—(1) decomposible organic matter; (2) water; (3) air. And it is also generally admitted that the mixture must be maintained within certain limits of temperature, and that all organisms are destroyed by boiling the fluid in which they subsist. Now, if all the organisms produced in a given infusion are, as the "Pan-spermists" say, the produce of "germs," it follows that these germs must exist either in the decomposible matter, or in the water, or in the air employed in the experiment. M. Pouchet therefore undertakes a series of experiments, with the view of systematically eliminating each of them in turn. He premises, however, that the real point at issue is the existence of germs in the air, as most even of his adversaries are ready to admit that the other two elements of the combination are easily within the management of the experimenter. It is well that this is the case; for, as we shall immediately show, M. Pouchet's position in respect to some of these points is far from being unassailable.[1]

The fact upon which M. Pouchet chiefly relies as demonstrating the possibility of the production of infusoria, where no germs can have been contained in the putrefiable matter which is made the subject of the experiment, is, that they are found to appear in infusions of organic matter which have been previously submitted to an extremely high temperature. Thus he took 10 grammes each of maize, peas, lentils, and beans; and having literally, as he says, carbonized them, he put

[1] Pouchet: Hétérogénie, p. 225.

them in separate vessels, containing each 500 grammes of distilled water, and placed the vessels themselves under a bell-glass. In twenty days, at a mean temperature of 20° Cent., infusoria were produced in all of them. In similar infusions, in which the grain used was not carbonized, animalcules higher in the scale and in greater abundance were produced in three days. In this instance M. Pouchet's experiments appear to us to prove his point; and as it is not a point of very cardinal importance, the proof will probably not be challenged. But in regard to the next step—that of eliminating the water as the element in organic infusions, which may carry the germs of animalcules—he is not equally successful. The experiment upon which he principally relies is one in which, after using water artificially formed by the combustion of hydrogen in air, he obtained organisms in his infusions. The method in which this artificial water was obtained was by burning a stream of hydrogen in the open air, having placed in a convenient position a metal plate, upon which the watery vapour might condense as fast as it was formed, and trickle down into a vessel prepared to receive it below. This process was continued for three days, at the end of which time sufficient water (500 grammes) was obtained for the experiments. Now, to this ingenious and pains-taking process it may, we think, reasonably be objected that it is not easy to see how the air of the laboratory or other apartment in which it was carried on could be sufficiently excluded to avoid all chance of ambiguity. No doubt, when the vapour first condensed on the metal plate, the temperature would be high enough to destroy such of the germs floating in the air around as might be deposited in it; but the trickling of the water down into the vessel must have caused some slight current of air to set in the same direction, and it may fairly be doubted whether the apparatus could be, or was, so arranged that the temperature at the mouth of the receiving vessel should still be high enough to effect the same purpose. In point of fact, the water thus trickling down into the vessel below would act in its degree precisely as an aspirator intended for the express purpose of collecting germs from the surrounding air, as M. Pasteur actually did in an experiment which we shall have to notice by-and-bye. It is a pity that M. Pouchet has not introduced into the plates at the end of his work an engraving in illustration of this experiment.

We come now to what may be called the central portion of M. Pouchet's work—namely, his elimination of the air as the source of the germs from whence infusoria are produced. It is well, before entering upon an examination of M. Pouchet's arguments, and the experiments upon which they are founded, to point out, as clearly and shortly as possible, what are the points required to be proved in order to establish either "heterogeny" or "pan-spermism," and also what are the peculiar difficulties which seem to render the problem before us almost, if not altogether, insoluble. The grand difficulty, which affects both sides of the question equally, is that confessedly the "germs" which are the matter in dispute, are incapable of being brought to the test of our senses. No magnifying powers which we yet possess can show them, nor can we ever say, whatever may be the degree of optical perfection at which our microscopes may hereafter arrive, that some particles do not exist which they may fail to show us, and that such particles may not be the germs of organic beings. Until we can see certain particles and watch them developing into vibrios or bacteriums, as we can watch an egg developing into a chicken, we can never settle this question of spontaneous generation by a direct appeal to the evidence of our senses. Besides this antecedent difficulty, which affects all investigation into the subject, there are, however, others no less formidable, which apply to each of the two views under discussion. The impassable barrier in the way of M. Pasteur and his fellow "pan-spermists," is the fact that they have to prove a negative. A man may say, "I made such and such a decoction or infusion of organic matter, and placed it in such and such circumstances, and I found no organisms developed in it;" but he is always open to the objections that he examined it too soon, and the organisms were not yet produced, or too late, and they were dead and decomposed; or that the precautions taken to avoid the extraneous introduction of germs were such as to destroy the conditions required for their development; or, finally, that the organisms being few in number, and extremely minute, might easily exist, and yet escape the acuteness of the observer —in short, that the latter is justified in asserting only that he has failed to find them, and not that they are positively absent.

The heterogenist, on the other hand, struggles against a weight of *à priori* reasoning, which renders the success of anything short of demonstration impossible. Spontaneous generation is essentially an "old-world" creed, and having been driven from every part of the organic world which can be made the subject of strict investigation and experiment, takes a last refuge among the very lowest of all organic beings, just for the very reason that their minute size renders accurate observation of them all but impossible. Such being the difficulties which stand in the way of each of the opposite views of this perplexed question, it follows that the heterogenist has far the easier task before him of the two. If the truth be on his side, he has only to show that organisms are produced under conditions which exclude the possibility of the introduction of germs from without, and he has proved his point; *à priori* objections will, in these days, avail nothing against a positive experimental demonstration. This M. Pouchet believes that he has accomplished, and in putting forth such pretensions he places his opponent in a position of some difficulty; for in order to establish his own view, he must not only be able to show that his experiments are fair ones, that is to say, are made under such conditions as do not militate against the development of organic life, but he must be also prepared to show that M. Pouchet's own experiments are inconclusive. Until both their conditions are fulfilled, however strong or general may be the *disbelief* in heterogeny among scientific men, its *disproof* is an achievement which yet remains to be accomplished.

The following, then, to return from this digression, are those amongst M. Pouchet's many experiments undertaken for the purpose now in question, which have appeared to us the most worthy of remark. The well-known experiment of Schultze, in which he isolated a decoction of organic matter from the surrounding air between two Liebig's bulbs, in one of which was contained concentrated sulphuric acid, and in the other solution of potash, and no organisms appeared in the decoction though the air was renewed day by day, is one of those upon which, previously to the investigations of M. Pasteur, the opponents of heterogeny chiefly relied. To this M. Pouchet raises three somewhat formidable objections: (1) He remarks, that when the bulbs were at length removed and the air freely admitted, Schultze found that organisms were developed in three days—i.e., somewhat sooner than they ordinarily appear in similar decoctions left open to the air from the first. (2) This experiment, even if accurate, would only prove that air transmitted through sulphuric acid is incapable of developing or sustaining life. (3) He has himself repeated the experiment, using sulphuric acid in both the bulbs and drawing the renewed air through by means of an aspirator, and in from twenty to twenty-five days he found both animal and vegetable organisms developed in his decoction.

Similarly, M. Pouchet states that he has repeated Schwann's celebrated experiment, in which he supplied fresh air to a decoction through a tube heated to redness, and found that no organisms were produced, with results the very opposite to those which Schwann obtained. Not satisfied, however, with thus destroying the credit of the evidence previously brought forward in favour of the "pan-spermist" view, M. Pouchet has also proceeded to establish his own hypothesis by independent experiment. As examples we select the following:

Having first filled a large vessel with boiling water, M. Pouchet introduced into it oxygen and nitrogen in the proportions in which they exist in the atmosphere, in quantity sufficient to displace about two-thirds of the water, and then placed in it a small quantity of hay previously heated to the temperature of boiling water. After the lapse of a month the infusion was found to be peopled with infusoria. This experiment we have noticed for two reasons—viz., because there are two points in which it is evidently open to objection. In the first place, it is a matter of great doubt whether the temperature of 100° Cent. *in air* is sufficient to destroy any germ which might be attached to the hay. It is admitted by both the disputants in this case that such a temperature in water is fatal to all germs, and upon this point we shall have more to say hereafter; but it is not equally certain that all will admit that air of this temperature has the same effect. Then, again, the experiment was performed over a mercury-bath, and M. Pasteur believes that the mercury in all ordinary baths, as they exist in laboratories, contains germs which have fallen into it from the air. Hence the use of a mercury-bath always introduces an additional element of uncertainty.

In another experiment M. Pouchet makes the following arrangements, which we can only render intelligible by employing letters to indicate the various parts of the apparatus. He takes two bottles, one with three and the other with two necks, A and B, and two open glass vessels, C and D, and places them alternately, the three-necked bottle, A, being on the right-hand; the open vessel C, the two-necked bottle B, and lastly, the other open vessel D. These vessels are connected as follows: Through the middle neck of the bottle, A, a siphon tube passes from half-way down this bottle to nearly the bottom of the open vessel, C. From the left-hand neck of A another tube passes, reaching nearly to the bottom of the bottle B, through the left-hand neck of the latter. Again, through the left-hand neck of B a similar tube passes from half way down B to nearly the bottom of the open vessel D. The right-hand neck of the three-necked bottle remains to be accounted for: through this passes almost to the bottom of the bottle another bent tube connected with a further tube of porcelain maintained at a red heat. The bottle A is filled with boiling water; B, with a decoction of hay, also at or near a boiling temperature; C and D contain merely a little mercury, sufficient to cover the mouths of the tubes which enter them from the bottles. The apparatus being thus arranged, a stream of air is pumped into it through the red-hot tube connected with the bottle A. The effect of this is as follows: The supply-tube going to the bottom of A, the air entering forces the boiling water through the tube in the middle neck into the open vessel C, until the fluid in A has fallen to the level at which the tube was placed. This point being reached, the air continues to enter, bubbles up through the fluid in A, and passes through the tube in its left-hand neck to the bottom of the two-necked bottle B. From thence, in a similar way, the decoction of hay in the latter bottle is forced over into the remaining open vessel, until it also falls to the level of the branch of the siphon which connects them—i.e., until B, like A, is half emptied of fluid. The apparatus was then left alone for six weeks, and the fact of its remaining air-tight through this time was proved by the fluid in all the vessels remaining at the level at which it was left when the air was originally pumped in. On examination, M. Pouchet found in the bottle which contained the decoction of hay, several tufts of penicilium and the remains of vibrios. In this case it would certainly seem as if all ambiguity were removed. The air with which alone the apparatus was supplied had to pass not only through a heated tube, but also through a body of water almost at the boiling point, before it reached the decoction in the bottle, and the mercury used can in this instance have introduced no element of ambiguity, since the siphons connecting the bottle with the open vessel must, we suppose, have been empty, and as no current of air or stream of fluid set from one into the other, it is impossible that any organism springing from germs in the latter could penetrate into the former.

Another experiment which, though not so conclusive as the last, is certainly not altogether without force, was this: M. Pouchet took eight Wolfe's bottles, each having two necks. A bent tube in the right-hand neck of the right-hand bottle communicated freely with the air by one end, the other reaching nearly to the bottom of the bottle. This first bottle was then united to the second by another bent tube, inserted only just below the neck of the first bottle, and passing almost to the bottom of the second. The rest of the series were similarly connected, the bent tube from the left-hand neck of the last bottle passing into an open vessel containing a little mercury. All the eight bottles being then filled with decoction of hay, air was drawn through the whole apparatus. It is evident in this case that the air must have been bubbled through the fluid in seven other bottles before it reached the last, yet M. Pouchet found that organisms appeared in *all* the bottles at the end of sixteen days, and that the last was just as fruitful as the first. Hence he argues, and certainly with some apparent justice, that were the germs of all these organisms floating in the air, they would certainly have been deposited in some of the earlier bottles, most of them in the first, and the last ought to have been comparatively, if not entirely, free from any manifestations of life.

The last experiment of M. Pouchet which we propose here to mention, is one in which he took two similar glass vessels, and filled them with equal portions of the same infusion, or decoction (for the experiment was tried with each) of hay; one of these he left in the open air, the other was covered with a plate of glass, and placed under a bell glass in a dish of water. In both glasses, after eight days, the same organisms were found in equal profusion. Certainly, as M. Pouchet remarks, on the supposition that the germs of these organisms were supplied by the air, it seems strange that the very limited quantity of air in contact with the decoction in the first vessel should have contained sufficient germs to people it in the same time as fully as that in the second, which was freely exposed to the atmosphere of the room.

By a large series of experiments, then, of which the above are but a small selection, M. Pouchet considers that he has proved that whereas, when a putrefiable body, air, and water are placed in contact, within a certain range of temperature, certain low organisms are produced, this production does not come from germs conveyed in either of the three elements of the combination, and that, consequently, it must be held that the organisms in question are generated spontaneously, and not produced, as are all other creatures, *ab ovo.*

We leave all criticism upon these experiments until we have given a slight sketch of those which have since been performed, both by M. Pasteur, in opposition to this view, and by M. Pouchet himself and others in its defence. This sketch we shall be compelled to make merely in outline, as the space which it would occupy, if given in detail, would leave no room within the dimensions of any ordinary article to estimate the comparative value of the experiments on both sides, and determine the actual position of the question at issue.

M. Pasteur tells us that he was led to grapple with this question as an almost necessary consequence of his researches upon the kindred subject of fermentation. His study of that subject had led him to the conclusion that all ferments, properly so called, are really organic beings, and that fermentation, instead of being an action set up by the contact of albuminous matter in a certain state of decomposition with a fermentible body, is really an action produced by the life, and growth, and reproduction of certain low kinds of organism. The mode of production of these low organisms in the various forms of fermentation became naturally the next subject of investigation. Are they produced immediately by the decomposition going on, or mediately by the development of germs, for which the fermentible matter forms a suitable element, and, if so, whence do the germs proceed? This was the question which presented itself at this stage of the inquiry, and thus the experimenter found himself face to face with the problem of spontaneous generation. With him, as with M. Pouchet, the main points requiring to be determined have reference to the air. Does the air, as a fact, contain the germs of living beings? If so, can these be excluded from the infusions which are subjected to experiment? And will such exclusion prevent all development of life in them, while it can be shown that the other conditions of the experiment are such as to be favourable to life, and the addition of germs only is required to enable it to break forth in abundant quantity?

An objection constantly urged against the views supported by M. Pasteur is, that no one has ever *shown* the germs in the air, which are assumed to play so important a part in the processes of putrefaction and fermentation. This M. Pasteur has triumphantly met by means of the following very ingenious experiment: he obtains a tube in the shape of the letter T, having a stopcock in each of its limbs; this being suspended in a horizontal position, the upper end of the cross-piece is attached to a cistern, and, by means of the cock, it becomes possible to regulate a stream of water passed through the cross-piece of the T tube to any quantity that may be desirable. By this means a current of air is constantly drawn at a regulated pace through the long limb of the T. The apparatus, in fact, becomes an aspirator capable of acting as long as the cistern contains any water. The long limb of the T is then connected with a piece of glass tube, passing through a hole in a shutter, and open to the air outside. In this glass tube a plug of gun-cotton is placed, and the apparatus set in action. Thus any given quantity of the external air can be drawn through the tube containing the gun-cotton, and literally filtered of whatever it contains. This process having continued for a considerable time, M. Pasteur withdrew the plug of gun-cotton, and placed it in a precipitate glass; then dissolving the cotton in a mixture of alcohol and æther, he left the dust which would not dissolve to collect as a precipitate at the bottom of the glass, to be afterwards examined microscopically. By this process he was able to discover that in dust collected in twenty-four hours there were contained a considerable number of small, round, or oval bodies, quite undistinguishable from the spores of minute plants and the ova of infusoria, though the number of them differed greatly according to variations in the temperature, the moisture and the stillness of the air, and the distance above the soil at which the air-filter was placed. The experimenter was, moreover, enabled by this method to preserve the dust collected for further experiment in a way which led, as we shall presently see, to important results.

This point, then, being established, M. Pasteur proceeded next to repeat Schwann's experiment with air passed through a heated tube, which he did in the following manner. Having taken a flask, and bent the neck almost horizontally, he placed in it 100 parts of water, 10 of sugar, and from 0·2 to 0·7 of albuminoïd and mineral matter obtained from yeast. The neck of the flask was then drawn out, so as to be capable of being sealed, and connected with a platinum tube passing through a furnace, and maintained during the experiment at a red heat. The contents of the flask were now boiled for two or three minutes, and then suffered to cool completely. The flask was then refilled with ordinary air, all of which, however, had been raised to a high temperature. Finally, the neck of the flask was sealed, and it was put aside in a temperature of 30 Cent. (86° Fah.). No organism whatever appeared in this decoction, or in any of a similar character. M. Pasteur's words are as follow : "J'affirme avec la plus parfaite sincérité que jamais il ne m'est arrivé d'avoir une seule expérience, disposée comme je viens de le dire, qui m'ait donné un résultat douteux." Other experiments, performed with equal care, had, however, led to diverse results ; but in these either a mercury bath had been used, or the liquid made the subject of the experiment was milk ; and M. Pasteur informs us further on in his researches that he always found the results unsatisfactory under those circumstances, and is led to believe that mercury baths, remaining exposed as they do to the air, become themselves the vehicles of germs, and that milk, in common with other alkaline fluids, in some way protects the germs contained in it, so that a greater heat or else a longer exposure to the boiling temperature is required for their destruction.

To complete M. Pasteur's chain of proof, one link only is now required. He has shown us that germs, or bodies not distinguishable from germs, do exist in the atmosphere, that they can be collected, looked at, preserved. He has shown us also that if means be taken to supply a decoction of organic matter with such air only as has been submitted to a degree of heat capable of destroying all germs contained therein, no production of life takes place in it. In his fourth chapter, he proceeds to supply this link, by relating how he has been able to take a decoction upon which the last experiment had been performed, and which had remained for a length of time unchanged, to sow within it some of the dust and germs obtained by his ingenious air-filter ; and how within a very few days the hitherto barren fluid has become fruitful and abounded in simple forms of life.

By adopting an apparatus which we fear it would be impossible to make intelligible to our readers by mere verbal description, but which is a modification of that last described, M. Pasteur has been able, without admitting any air except such as had been previously heated, to break off the neck of one of his flasks, and to introduce a small tube of glass, containing a bit of the cotton from an air-filter, and once more to seal up the neck as before. The constant result has been, that in from thirty-six to forty-eight hours organisms have been developed in the flask, in about the same time, that is, as would have been required to produce them in the same fluid if left freely open to the air. The same result followed if asbestos was used instead of cotton to form the filter, thus removing any ambiguity that might be supposed to be introduced by the use of an organic body for this purpose. For this series of experiments, as for the last, M. Pasteur claims invariable success and absolute infallibility.

"Il ne m'est pas arrivé une seule fois," he says, "de voir rémover les expériences *à blanc*, comme je n'ai jamais vu l'ensemmencement des poussières ne pas fournir des productions organisées. . . . . En présence de tels résultats, confirmés et agrandis par ceux des chapitres suivants, je regarde, comme mathématiquement démontré, que toutes les productions organisées qui se forment à l'air ordinaire dans de l'eau sucrée albumineuse, préalablement portée à l'ébullition, ont pour origine les particules solides qui sont en suspension dans l'air . . . . ces corpuscules sont dont les germes fecondes de ces productions."

M. Pasteur further proceeds to corroborate his views by several series of experiments—all *invariably* successful—by means of which he establishes, very much to his satisfaction, the following propositions: (1) That the conclusion above drawn from the case of yeast can be extended to various other organic fluids, as urine, milk, &c.; but that when, as in the case of milk, the fluid employed is alkaline, either a slightly higher temperature than that of boiling water, or a longer exposure to that temperature than was required in the other experiments, was necessary, in order to the destruction of all the germs contained in the fluid. (2) That if an infusion similar to those above used be simply placed in a flask with a long drawn-out and bent neck, and it be then boiled until the steam passes off freely by the neck, it may be left with the neck unsealed, and will even then remain quite unchanged. There will, of course, in this case, be no current of air setting into the vessel, and what few germs enter the neck will be arrested in the curves of it. If, on the other hand, after it has thus remained unchanged for many weeks, the neck be cut off, the decoction will become peopled in from twenty-four to forty-eight hours. (3) That germs do not pervade the atmosphere equally, but, while plentiful in common localities, are almost or altogether absent from others. Thus, decoctions enclosed with due precautions in deep cellars, or on the tops of mountains, such as the Jura or Montanvert, were found frequently to remain quite unchanged, exactly as do those which are supplied with air artificially deprived of its germs. (4) Finally, that the mercury-bath introduces, as we remarked above, a new element of uncertainty into all experiments on this subject in which it is employed. He further finds that he is able to produce organisms in a mixture quite free from all albuminous constituents, and containing only water, sugar-candy, tartrate of ammonia, and a little ashes of yeast—a fact proving, as he considers, that the part played by the albuminous matter in an ordinary organic infusion is simply that of an aliment for the growing and multiplying organisms in it. M. Pouchet's reply to this very elaborate and ingenious monograph of M. Pasteur is certainly not a success. It appears in the 'Ann. des Sciences Naturelles' for 1862, p. 277. Those of our readers who care to refer to it will find that it contains much more vituperation than argument, and that what arguments are to be found in it have been, for the most part, met by M. Pasteur by anticipation. There is, however, one curious experiment therein mentioned which requires some discussion and explanation. M. Pouchet finds (p. 297) that if the same quantity of the same fluid be placed in two vessels, one deep and narrow, the other shallow and wide, the more highly-organized and larger infusoria will appear in the former vessel, but not in the latter; and he argues, if the germs dropped into both vessels from the surrounding air, you ought to have a much larger number in the wide vessel than in the narrow one. But the difficulty here is more apparent than real. In each case the organisms first to appear are the lowest of all—viz., the monads, bacteriums, and vibrios; and it is only after the appearance, the life, death, and decay of these, and after a thick stratum of their dead bodies has been formed at the top of the narrow vessel, that the more highly-organized creatures are produced. It is this stratum of bodies of vibrios, &c., which M. Pouchet calls the proligerous membrane or stroma, and in which he affirms that the spontaneous production of the ciliated infusoria takes place. Now, it is evident that the life and death of myriads of minute organisms cannot have gone on without working some change in the constitution of the fluid in which they existed; and it is surely less improbable that that change should be one which should fit it for the maintenance of creatures more advanced in the scale of creation than that it should be such as actually to give rise to the formation of these creatures themselves. It is therefore most reasonable to believe that in the experiment just referred to the ova of the highly-organized animalcules do, of course, fall in greater numbers into the wide and shallow vessel than into the deep and narrow one, but finding a fluid in the former not suited to their development, remain inert and unproductive, and these escape unnoticed.

Another step has since this time been made by M. Pasteur in investigating the natural history of these minute organisms, which, if it should be corroborated by the evidence of other observers, will certainly go far to explain their appearance, without compelling us to have recourse to M. Pouchet's theory of a proligerous membrane formed by the bodies of bacteriums and vibrios, in which the more complex organisms are synthetically constructed. M. Pasteur takes a mixture, consisting of tartrate of lime and small quantities of phosphate of ammonia, and other alkaline and earthy phosphates, in distilled water. From this mixture, by a process which we need not detail, he draws off and excludes all free oxygen or air. He sows in it a few infusoria taken from some spontaneously fermenting tartrate of lime, and he finds that the creatures multiply in the mixture till the whole of the tartrate of lime has disappeared. Thus he is led to the conclusion that these are capable of living, and growing, and multiplying, without any contact with oxygen, at least in its uncombined state, and further investigations have convinced him that the natural order of the phenomena which take place in an organic infusion exposed to the air is somewhat as follows: The first organisms to be developed in it are certain low infusoria, such as bacteria tenera. These pervade the whole fluid, consume whatever free oxygen it contains, then die for lack of this very gas, and give place to other equally low or lower creatures which live without oxygen, and, indeed, perish if brought in contact with it. These occupy the lower strata of the fluid, while those near the surface are inhabited by organisms which consume the oxygen of the air above, and thus protect the others from its destructive contact. It may be mentioned by the way, that it is these newly-discovered creatures, thus capable of existing without oxygen, which M. Pasteur looks upon as forming the real agents in fermentation, thus reducing this process to one of the growth and nutrition of living beings, and entirely exploding the old views of it as a catalytic or contact action, whatever that may mean, or a process to which the presence of albuminous matter in a certain state of decomposition is absolutely necessary.

Since this very important announcement of M. Pasteur, the contributions made by the various disputants in France to the literature of the subject before us have not been calculated either to throw much new light on the matters in dispute, or to enhance very greatly the dignity of the learned men engaged upon it. In a former part of this article we mentioned the fact that M. Pasteur had established to his own satisfaction that a vessel containing a highly alterable decoction of organic matters, sealed up *in vacuo*, may be opened, filled with air and resealed, in certain localities, such as the tops of high mountains, and yet the contents remain in many cases unaltered. Thus he found that among twenty vessels so treated on the Jura, organisms were developed in five only, and from thence he concluded that the property of the air which gives rise to such phenomena is not always to be found in it; in other words, that they are produced not by air merely as such, but by something in the air which is not equally distributed through it, as might, for instance, be supposed to be the case with germs.[1] These experiments three of his opponents in conjunction—viz., MM. Pouchet, Joly, and Musset—repeated in the course of last summer, employing eight vessels only, and opening them at considerably greater elevation on the Pyrenees than that at which M. Pasteur's experiments were performed. These observers, as might be expected, obtained results completely contrary to those of M. Pasteur,[2] finding organisms developed in every one of their vessels, although they professed to have observed all the precautions recommended by their opponent.[3] They communicated their success to the Academy, and from that time the dispute has almost taken the form of a personal squabble. M. Pasteur replied by some very minute criticisms upon his adversaries' method of conducting their experiments (which, however, received the countenance of several eminent physiologists, among them Mr. Milne-

[1] Op. cit., p. 77. [2] Comptes Rendus, Sept. 21, 1863.
[3] Comptes Rendus, Nov. 2, 1863.

Edwards), and by a reiteration of his previous assertions. The chief points of M. Pasteur's criticism were, that the experimenters had not made a sufficient number of trials, and that in opening the necks of their vessels on the mountain top they had employed a file instead of a pair of pincers with long handles. The latter objection is so very minute, that but for Mr. Milne-Edwards' notice of it it might almost have been disregarded; but even allowing it some weight in itself, we think it must lose it when taken in connexion with the numerical differences between the results. Thus it is conceivable that the use of the file might have spoilt one or two experiments, but more effect than this we cannot reasonably attribute to it. The other objection may at first sight seem to have more force, but in reality it has but little, for a simple calculation of chances is sufficient to show that if, in M. Pasteur's experiments, five vessels only out of twenty were found to contain germs, it is in the last degree improbable that eight in succession should follow the exceptional instances, and not the rule.

M. Pouchet has, however, not contented himself with attacks made desultorily from time to time, in reply to M. Pasteur's communications to the Academy, but has in the present year published an elaborate essay containing his more recent experiments on the whole subject of spontaneous generation. This essay has derived some additional interest from the fact that it was originally sent in competition for the prize offered by the Academy for researches on this subject, but was withdrawn before the day of decision (as was also that of MM. Joly and Musset), because, as the author states, the commissioners appointed to adjudge the prize were all previously committed to the doctrine of his opponent. We cannot pretend, in an article which treats of the whole question generally, to review thoroughly either of the two systematic treatises of M. Pouchet,[1] but we must in fairness say of them, that they deserve more attention by far than they seem at present to have received at the hands of English physiologists, and that no one can fairly judge of the state of the question at issue unless he has given them a thorough consideration. Speaking for the moment only of the two principle controversialists, we think that the experiments of M. Pasteur have hitherto been considered as more exact and convincing than those of his rival; indeed, the weak point of the 'Heterogénie' throughout has lain in an insufficient exclusion of disturbing causes. This defect in the defences of his opponent has not escaped the vigilance of M. Pasteur, and accordingly no weakness of the kind can be charged upon his own experiments. They, on the contrary, are as rigid and as exact as if the problem with which he had to deal was of the simplest kind. Nevertheless, we are by no means convinced that M. Pouchet's objections to them are not somewhat formidable. He says in effect, life and organization are too delicate, too subtle, to be handled so roughly as you propose; and if, after torturing your substances as you do, and submitting them to all imaginable unnatural conditions, you find no signs of life in your vessels, it is at

[1] Pouchet: Nouvelles Expériences, p. 14.

least as probably because you have destroyed its necessary conditions as because you have excluded those *quasi*-metaphysical "germs" which you maintain are diffused throughout the atmosphere.

Arguments of this kind M. Pouchet uses constantly. In themselves, indeed, they do not go far, inasmuch as his conditions of life are as much his own speciality as are his opponent's germs, and he never fails, moreover, to enforce them in an effective if somewhat Hibernian manner by relating experiments of his own, in which, under conditions almost exactly similar to those employed by M. Pasteur, he has obtained precisely opposite results. And it is to the experiments, after all, and not to the argumentation, that we must look for the final decision of the question, if, indeed, it be capable of decision at all. In experimental evidence, accordingly, this last work of M. Pouchet is remarkably rich. One or two of the experiments we must cite, but they will serve for examples only, and we must refer our readers to the Appendix to M. Pouchet's work for the rest.

In the first place, there is a modification of Schultze's well-known experiment, to which we have already referred. This is performed by M. Pouchet in the following very simple and apparently satisfactory manner:—He places his infusion in a flask, boils it for a considerable time, then immediately adjusts to its neck a funnel with a syphon tube attached, in the curve of which are several bulbs containing concentrated sulphuric acid. The infusion is then boiled again for five minutes, so that the steam bubbles through the sulphuric acid; and the whole, after being cooled slowly, is set aside. By this process it will be seen that the air within the flask is only renewed to the extent necessitated by any changes of temperature to which it may be exposed, and that whatever renewal actually takes place does so only by the passage of the air through the acid; yet, nevertheless, M. Pouchet assures us that, though he has tried it with a variety of substances and very frequently, he has constantly found organisms developed in the infusions. This experiment is the more worthy of notice inasmuch as Schultze's investigations have attracted great attention, and were believed by many to have settled the question against heterogeny altogether. Schwann's early experiments with heated air have also been repeated by M. Pouchet with quite opposite results to those which have followed them in the hands of M. Pasteur and others; but in this case he has introduced a modification which, in our opinion, completely vitiates the experiment. Instead of simply boiling his substance in the water contained in his apparatus, M. Pouchet has submitted it first to a dry heat of 200° (cent.), and then contrived, by placing it in the neck of the flask, lying horizontally, to expose it to the steam of the water while boiling, and immerse it therein only after the boiling has ceased. The object of this arrangement appears to be to prevent the decoction being submitted to the action of the distilled water dropping from the sides of the vessel during boiling—an action which M. Pouchet believes to hinder, in some not very intelligible manner, the development of organisms in it. The arrangement, however, as we have said, vitiates the experiment, inasmuch as the degree of *dry* heat which organisms in some forms can endure without destruction is a matter still in doubt; nay, it is one intimately connected with the question of spontaneous generation, and almost as hotly disputed; one, therefore, which the experimenter should be especially careful not to import into his investigations. M. Pouchet, no doubt,[1] has settled the question by his own experiments to his own satisfaction; but so long as it is not looked upon as settled by the scientific world in general, to assume it for the purpose of deciding another disputed point is merely to expose oneself to an unnecessary defeat.

We have room for but one more of M. Pouchet's new experiments; and we select one which from its simplicity is easily repeated, and yet which, if exact, is of no small importance. M. Pouchet takes a quantity of flax, soaks it in water for six hours, then filters it, and divides the clear fluid coming from the filter into two parts. Of these one is placed in a flask and hermetically sealed; the other is put into a narrowish upright vessel, and enclosed under a bell-glass of the same capacity as the flask used for the other portion. The bell-glass dips into some mercury previously heated to 160° (cent.). Thus the two portions of the fluid are placed without any precautions in equal quantities of air, and all change of atmosphere in both cases equally precluded. After eight days the two fluids were examined, and the organisms found to be quite unlike in the two. In the flask were only the lowest kinds of infusoria—monads, bacteriums, and vibrios. In the portion under the bell-glass were some "spontaneous eggs" and myriads of ciliated animalcules, such as colpodas, &c. If this experiment is accurate, it is certainly difficult to see how the germs of the one kind of creatures should have entered or become developed in the one vessel and entirely different kinds in the other.

The phrase, somewhat new to the English reader, "spontaneous eggs" (*œufs spontanées*), which we have just quoted from M. Pouchet, may serve to remind us that we have left quite unnoticed hitherto what may be called the positive side of the heterogenist's argument. We have noticed the objections to the reasoning of their adversaries, and have quoted some of the experiments which have led them to such opposite results. It remains for us to say a very few words upon the observations and experiments by which they propose to establish, not the probability, but the actual existence of spontaneous generation, as a phenomenon which is capable of being observed. M. Pouchet gives a distinct account of the various steps in the process of the spontaneous production of animalcules of the genus *Paramecium*, as observed by himself in an infusion of darnel (*Lolium temulentum*).[2] The grass was steeped in water for one hour, and the water then filtered off and put aside. On the next day a number of monads appeared on the surface of the filtered fluid. These were nearly all dead on the following day, and their bodies formed a thin granular scum on the surface. On the third day there began to appear some of the spontaneous eggs abovementioned in various stages of development. They appeared at

[1] Nouvelles Expériences, p. 39 et seq. [2] Ibid., p. 111 et seq.

first as little greenish-yellow masses, formed of some of the granules of the scum. The central granules were larger and closer together than the rest, and the outside ones more delicate and less closely packed, forming, as the mass gradually took a spheroidal form, a kind of *Zona pellucida.* This was more distinct in other specimens, and then the vitellus was seen in gyration. On the fourth day almost all the eggs were perfectly formed, and on the fifth perfect parameciums appeared. The changes seen were in fact exactly the same as those observed by M. Pouchet himself as taking place in the development of mollusca and by other naturalists in various low organisms. In the lowest infusoria, such as the Bacteriums, all these changes cannot be followed; but they are seen upon close observation of an infusion to appear *en masse* in a way quite inconsistent with the notion of their being produced from eggs dropping accidentally from the surrounding air. The surface of a fluid in fermentation is seen covered with an almost imperceptible mucous film. In this film there appear all at once a number of pale motionless lines, nearly parallel to one another, and of the form and size of bacteriums, and these after some hours become living and active infusoria.[1] These results, though brought out by the original researches of M. Pouchet, do not rest upon his authority alone. MM. Joly and Musset, of Toulouse,[2] and Professor Schaafhausen,[3] of Bonn, have arrived at very similar conclusions quite lately; and Professor Mantegazza, of Pavia,[4] as long ago as 1852, gave a most interesting and striking account of an observation made by him upon the development of bacteriums, in almost the same terms as those which we have just borrowed from M. Pouchet. Mantegazza spent sixteen consecutive hours in observing these phenomena with the microscope.

In concluding this portion of our subject, we will mention but two more experiments. They appear to be well established; and if they should turn out correct, it is at least not easy to see how they can be reconciled with the Pan-spermist theory. The first is an experiment of M. Pouchet's own.[5] He takes a flask, plunges it into a vat of wort, which has been boiling for five hours; and after having kept it there for ten minutes, seals it while under the surface, and brings it out again. It is admitted on all hands that all organisms are killed by a moist heat of 100° (cent.); yet in this case, after eight days, a considerable quantity of yeast plant was developed in the flask. The other is one which he quotes from Treviranus and others, and has often verified himself. Three beakers are taken: in one is placed cyder, in a second urine, in the third a mixture of these two fluids. The vegetation in the first differed from that in the second, and that in the third was quite distinct from both.

We have now finished, not indeed a summary, but a very rough and imperfect sketch of the evidence which has been adduced on both sides of this vast, obscure, and almost hopeless but still interesting

[1] Nouvelles Expériences, p. 116.

[2] Joly and Musset: Comptes Rendus, 1860, vol. l.

[3] Schaafhausen: Comptes Rendus, 1862, vol. liv.

[4] Cosmos, 1863, p. 630.

[5] Nouvelles Expériences, pp. 126, 127.

and highly important question. It remains for us in the last place to endeavour to estimate the value of the evidence, and to show, if possible, what is the actual position in which the controversy stands. Where some of the greatest names known to science are to be found ranged on opposite sides it is not for us to attempt a decision; nevertheless, as has been well said by a distinguished writer on a very different subject, "the attempt to decide questions in philosophy (or science) by polling authorities on either side would be interminable and hopeless," accordingly we do not attempt either to poll authorities or to decide the point in dispute between them, but content ourselves with an attempt to lay before our readers as clearly, as impartially, and, above all, as shortly as possible, the present position of the question. To do justice to the subject would require a volume rather than an article.

On the one hand, we have the conclusions drawn by M. Pasteur from his own experiments, forming a complete chain of facts with no link missing, and, if they fairly represent the actual state of our knowledge, justifying M. Flourens, Mr. Huxley, and others in their assertions that the whole is definitively decided by them, M. Pasteur finds: 1. That he can actually show certain bodies collected from the air which have all the appearance of being the eggs of minute creatures. 2. That when proper means are taken to admit into a putrescible decoction such air only as has been passed through a heated tube, such decoctions may be kept free from all signs of organic life for an indefinite time, and that they may even be left freely exposed to the ordinary air, provided that it can reach them only through a long, narrow, and crooked tube, in the bends of which all the ova contained in it are deposited. 3. That when the supposed ova collected from the air are sown in decoctions previously kept as above described without change, organisms are produced within a given number of hours. 4. That under certain circumstances, as, e.g., at the tops of mountains and in deep cellars, air may be obtained in considerable quantities which is as incapable of producing change in the most highly alterable fluids as is that which has been passed through a heated tube. Besides these main propositions there are a number of other conclusions to which M. Pasteur has been led by his researches, which are of the highest interest, and which are related inseparably, though only indirectly, to the subject immediately before us—viz., 5. That all putrefaction, as also all fermentation, properly so-called, has as its efficient cause the life, growth, and reproduction of some kind of infusorial organism, without which no such action can proceed; and, 6. That so far is oxygen from being the cause or even a necessary condition of such actions, that many of the infusoria on whose existence they really depend pass their lives without oxygen, and are even killed by its presence. The order of phenomena in the decomposition of many fluids, according to M. Pasteur, is therefore as follows: The infusion being exposed to the air, and having air dissolved in it, derives first some ova from the surrounding air; then certain kinds of infusoria are developed in it. These consume the oxygen contained in the fluid, and all die except those at the surface, and are succeeded by another kind which live without oxygen, being protected from its approach by the active oxygen-breathing infusoria at the top and the film formed by the bodies of their predecessors. Such are M. Pasteur's chief generalizations from his experiments, and we are bound to admit that, if the experiments are accurate, they are not wider than the grounds upon which he goes will bear. But it is difficult to exaggerate their importance. Not only do they claim to settle for ever the vexed question of heterogeny, but also to revolutionize completely the whole theory of fermentation, and, in some measure, also all our ideas of the phenomena of life. That they should be subjected therefore to the most rigid scrutiny is no more than is to be expected, and no more than is right.

Accordingly, on the other hand, we find that M. Pouchet disputes almost every single proposition of M. Pasteur, and sets to work to establish positively the very contrary doctrine. Even if M. Pouchet stood alone his views would deserve more consideration than they have met with at the hands of some distinguished men, both in his own country and also here. A physiologist whose work is spoken of by Professor Owen in the highest possible terms is at least not a person to be despised. But, as a matter of fact, M. Pouchet does not stand alone. When such men as MM. Joly and Musset at Toulouse, Professors Mantegazza, at Pavia, Wyman, at Cambridge, U.S., and Schaafhausen, at Bonn, all working independently of one another, all in a greater or less degree lend their support to his views, and all controvert those of M. Pasteur, it is surely idle to speak of the question in dispute as finally settled by the experiments of the latter. On the first point—namely, that of the discovery of ova in the air—while other observers find them but very few and far between, M. Pasteur himself, as far as appears from his plate and his description, does not discover a sufficiently large number to play the very important part which he assigns to them, except on the supposition that the reproduction of these creatures is much more rapid than we have any reason to believe it to be. Then as to the cardinal proposition, that no infusoria are produced in putrescible infusions supplied only with air previously heated to 100°, it must be remembered that M. Pasteur is the only observer who, having tried this fairly and extensively, is able to state that he has been always successful, and that, on the other hand, no less than five thoroughly competent observers have arrived at contrary conclusions; and it is a question which is open to every one to answer as he pleases, whether it is more probable that M. Pasteur should be mistaken, or that the whole of those other five physiologists should be incapable of carrying on an investigation requiring care and accuracy. There are two considerations connected with this part of the subject which ought not to be disregarded. In the first place, it will be admitted by all that, whatever be the efficient cause of the life of these low organisms now under investigation, it is produced in close glass vessels under considerable disadvantages, more especially when the fluid in which it is to live has been boiled. Hence we should naturally expect that it would be scanty in quantity, as well as low in the scale of existence, and therefore very easily overlooked in a microscopic examination. Again, it should be remembered that the organisms produced under such adverse circumstances are also very short-lived, and are not succeeded by others, as is the case under natural conditions; and we speak from our own experience when we say that if an observer in such cases judges by the fluid in his vessels becoming turbid, he will often reckon a specimen as altogether sterile in which a careful microscopic examination would detect a few organisms. They would, moreover, more easily escape notice if the decoction in which they exist be left, as was the case with some of M. Pasteur's, until they had long since died and fallen to the bottom of the vessel as a granular precipitate.

It is the point which we have placed third in our summary which has perhaps gained more proselytes for M. Pasteur than any or all the others—the statement, namely, that he has been able to sow particles of dust collected from the air in decoctions preserved for a long time unchanged, and in a few days organisms have been developed in them. This statement M. Pouchet meets very summarily, but not very convincingly, by affirming that M. Pasteur really sowed nothing, and that what he saw spring up was simply that which is ordinarily produced by spontaneous generation in such fluids as he used for his experiments. This assertion is, we think, hardly a fair one; for the productions which M. Pasteur enumerates, and some of which he figures as produced by this means, are somewhat too various to be accounted for in this way. There is, however, another objection to which these experiments are open—viz., this: M. Pasteur, in the somewhat elaborate apparatus which he uses for these experiments, employs a T-shaped tube with three stop-cocks, and in order to introduce his bits of cotton with the ova attached into the previously sealed vessels, he is obliged to exhaust this T-shaped tube several times in succession by means of an air-pump. M. Pouchet is quite justified in his remark, that had the heterogenists ventured on so inexact a proceeding they would certainly have been charged with inaccuracy in the experiment. It certainly seems to us that such a proceeding as that of opening the glass globes in which the decoctions had been preserved unchanged, and thus renewing the air contained within them, even although the newly admitted air has also been heated before admission, at least introduces an element of uncertainty into the experiment, and may easily be supposed to alter its condition in other ways than the one intended by the experimenter. With regard to the unfruitfulness of the air as found upon high mountains and in caverns, it is sufficient to remark that, as we have already shown, the accuracy of M. Pasteur's facts is disputed by his three principal opponents.

It is thus seen that the experimental evidence on the whole subject of the production of infusoria is unsatisfactory and conflicting. It is also incomplete, and is especially incomplete on the side of the "Pan-spermists," for M. Pasteur has entirely failed to show anything like a sufficient number of ova in the air to produce the results which he attributes to them, and has not sufficiently accounted for the succession of different kinds of organisms which takes place in the same fluid. It is difficult to see why, the ova of both being supplied by the surrounding atmosphere, a quantity of bacteriums should be developed and die first, and a generation of parameciums follow them; whereas there is some show at least of analogy to the other phenomena of nature in the gradual advance in the type of living beings produced, on the hypothesis of their being spontaneously generated. The experiments of the chief supporters of both views are, we believe, shortly to be repeated before a commission of the Academy of Sciences, and it is to be presumed that so much of the question as can be decided by experiment will by this means be cleared up. It is unfortunate, however, that several of the members of this commission should be persons who are already committed to one of the doctrines which are to be brought before them for judgment. We do not for a moment doubt the perfect fairness and impartiality of these distinguished individuals, but at the same time we cannot but look upon their selection as judges on this occasion as unfortunate, inasmuch as it is always an invidious thing for any man to have to sit in judgment on the conduct of another who has expressly come forward as the opponent of a doctrine of which the judge is an avowed supporter.

We repeat, that to us the experimental evidence is at present unsatisfactory, and if the balance inclines to either side it is rather in favour of the heterogenists, inasmuch as their direct observations of the production and development of "spontaneous eggs" have not been disproved, or, as far as we know, successfully controverted. If any one therefore desires to form a judgment upon the question in its present stage, he will be driven to do so upon *à priori* grounds, or on merely analogical reasoning. And even here there is more to be said in favour of heterogeny than many are aware of; and Prof. Huxley, who professes to be convinced of the universal distribution of germs by M. Pasteur's experiments, expressly declares that he can see no *à priori* objection to its truth. It has been said—and it is a view of the subject which is sure to be attractive to many minds—that the belief in spontaneous generation varies directly with our ignorance of the real physiology of reproduction and development. Thus the ancients believed in the spontaneous generation of rats and mice. This belief was speedily dissipated by the advance of knowledge; but still, till the time of Redi, the maggots in putrid meat were universally supposed to be immediate products of decomposition, and so from that time downwards the belief has attached always to any class of organism of the real history of which we are ignorant, until at last it has become confined exclusively to the lowest, most obscure, and least known of all classes of living beings, and is probably as false in this last case as in those which have gone before. Now the value of such reasoning as this is really very small. It would apply with just as much force to a number of facts which are now universally admitted. Take, for instance, the phenomena of reproduction by fission or by budding. If we could suppose some naturalist now for the first time to announce this as taking place in some one particular class of organism, he would most likely be at once told that, as all analogy was in favour of sexual reproduction, his observations must be erroneous and his conclusion a mistake. But as we now know that nature has a line—not well defined and sharp and abrupt perhaps, but, like all the lines of demarcation in nature, indistinct and sometimes hardly traceable, below which reproduction does take place in this to us abnormal manner—why should there not be another line fixed far lower in the scale of creation, below which creatures are formed piece by piece, as M. Pouchet says, out of particles of dead matter, in the way which he and Schaafhausen and Mantegazza tell us that they have themselves witnessed?

Review X.

1. *Der Kehlkopspiegel und seine Verwerthung für Physiologie und Medizin.* Von Dr. Johann Czermak. Zweite, theilweise umgearbeitete und vermehrte Auflage.—*Leipsig*, 1863.

The Laryngoscope and its Employment in Physiology and Medicine. By Dr. J. Czermak. Second edition, revised and enlarged. pp. 132.

2. *Recherches Cliniques sur diverses Maladies du Larynx.* Par le Dr. Türck.—*Paris*, 1802.

Clinical Researches on various Diseases of the Larynx. By Dr. Türck.—*Paris*, pp. 100.

3. *Etude Pratique sur le Laryngoscope et sur l'Application des Remèdes topiques dans les voies Respiratoires.* Par le Dr. Edouard Fournié.—*Paris*, 1863.

Practical Study on the Laryngoscope, and on the Application of topical Remedies in the Respiratory Passages. By Dr. Fournié.—*Paris*, 1863. pp. 110.

4. *Die Laryngoskopie und ihre Verwerthung für die Aertzliche Praxis.* Von Dr. Friedrich Semeleder.—*Wien*, 1863.

Laryngoscopy and its Employment in Medical Practice. By Dr. Semeleder.—*Vienna*, 1863. pp. 88.

5. *Lehrbuch der Laryngoskopie.* Von Dr. Adelbert Tobold.—*Berlin*, 1863.

Manual of Laryngoscopy. By Dr. A. Tobold.—*Berlin*, 1863. pp. 148.

6. *Klinik der Krankheiten des Kehlkopfs und der angrenzenden Organe.* Von Dr. Georg Lewin.—*Berlin*, 1863.

Diseases of the Larynx and the neighbouring Organs. By Dr. G. Lewin.—*Berlin*, 1863. pp. 395.

7. *Ueber Neubildungen namentlich Polypen des Kehlkopfs.* Von Dr. Georg Lewin. ('Deutsche Klinik,' Nos. 12, 13, 18, 19, 20, 21, 23, 25, 26. 1862.)

On New Formations, especially Polypi, in the Larynx. By Dr. Georg Lewin. ('Deutsche Klinik,' Nos. 12, 13, &c. &c. 1862.)

8. *Die erste Ausrottung eines Polypen in der Kehlkopshöhle.* Von Dr. Victor Bruns, Tübingen. (Nachtrag dazu.)

The first Extirpation of a Polypus from the Laryngeal Cavity. By Dr. Bruns, Tübingen. (Sequel thereto.)

9. *Studien und Beobachtungen über Stimmbandlahmung.* Von Prof. C. Gerhardt. ('Virchow's Archiv,' Bd. xxvii.)

Studies and Observations on Paralysis of the Vocal Cords. By Prof. C. Gerhardt. ('Virchow's Archiv,' vol. xxvii.)

Montaigne observes that

"The promises of physicians are incredible. They would persuade you that of their ingredients, this one will warm the stomach, this refresh the liver, one go straight to the kidneys, and thence to the bladder, without exercising its powers elsewhere, another dry up the brain, and another moisten the lungs. I fear most truly that they must lose or change their addresses on the road, and excite trouble in the wrong quarters."

The sentiments expressed by the wise and witty Frenchman more than three hundred years ago, might find supporters in these days among the very class of men against whom his playful sarcasm was levelled, for a feeling in favour of direct treatment is certainly one of the medical tendencies of the age. The treatment of local disease by local remedies is making progress every day, and the triumphs of this therapeutical system are already both great and numerous. Faradisation is now highly appreciated, and extensively employed. The hypodermic method of applying remedies has already been shown to possess numerous advantages, and is undoubtedly capable of a far wider application. Acupuncture, and the division of nerves for the relief of pain, are also promising methods for future trial; and dermatologists are daily proving that certain diseases of the skin, which were formerly supposed to require "a course of medicine," can be more easily cured by local agents. We could easily multiply proofs to show the advances made in direct therapeutics during the last ten or twenty years, but it is sufficient to refer to the science of gynækology. Without going into details we may remark that, in this department of medicine, it is impossible to estimate the saving of human misery which has been effected by the application of the system of direct therapeutics to diseases of the ovary. The invention of the laryngoscope has transferred another class of affections from the visionary region of surmises to the *terra firma* of direct therapeutics.

Since we last took a general view of the subject, the art of laryngoscopy and our knowledge of diseases of the larynx have both made progress. Our means of diagnosis are not, perhaps, better, but we have now an elaborate *materiel* for the treatment of laryngeal disease.

The historical sketch which we formerly[1] gave of the invention of the laryngoscope has now to receive the background of some important additions. In an interesting communication which Mr. Windsor recently furnished to this journal, it is shown that as early as 1807 Bozzini employed an arrangement of mirrors for "illuminating internal cavities and spaces in the living animal body." In the work which he published at Weimar at that time, it does not appear that he specially recommended "this simple apparatus" for inspecting the larynx, but he advised its employment for examining the posterior nares. In 1829, Dr. Benjamin Babington exhibited some mirrors at the Hunterian Society, closely resembling those now in common use, with which he said it was possible to inspect the larynx. In 1838, M. Baumès showed a mirror, about the size of a two-franc piece, to the members of the Medical Society of Lyons, and described it as being very useful for examining the larynx and posterior nares. In 1840, Liston, in the third edition of his 'Practical Surgery,' made that reference to a mode of examining the larynx which led Professor Czermak, in his first pamphlet, to speak of the Liston-Garcia laryngoscope. In 1844, Dr. Warden succeeded more than once in inspecting a diseased larynx; and in 1846 Avery invented his laryngeal speculum. We have already pointed out the merits and shown the defects of Avery's instrument, and we have little to add with reference to Garcia, Türck, and Czermak. Research or accident may, perhaps, show that the idea of examining the larynx by means of reflected light was of even earlier origin than we have here indicated; but to Professor Czermak will always be due the great merit of having so simplified and improved the instrument, that it can be applied with comparative facility to the relief of suffering humanity. From 1807 to 1857 the invention—if such it may be called—was of no use to any one; but when, in the latter year, the clumsy dentist's mirror passed into the dexterous hands of Dr. Czermak, a transformation was soon effected, and with the laryngoscope a new key was obtained to the portal of life.

The laryngoscope which Professor Czermak gave to the profession left little to be desired as regards the mechanism of the instrument, and we accordingly find that it has undergone no alteration. We might, perhaps, make an exception in favour of the plan of having the reflecting mirror opposite the forehead, instead of being placed in front of the eye. This method is employed, and has been strongly recommended by Dr. George Johnson, and it is also practised by Dr. Fournié. Dr. Bruns uses a laryngoscope in which the reflecting mirror is suspended between the eyes—a position which we should certainly think less convenient than that employed by Dr. Johnson. Though these plans do not enable the practised laryngoscopist to see the interior of the larynx more distinctly, they appear to facilitate the management of reflected light, and thereby to diminish one of the most serious difficulties of the beginner. This method was received at first with an opposition that did not surprise us; for, as Dr. Semeleder

[1] Vol. xxx. p. 340.

observes, "every jester prefers his own cap and bells." We do not expect that those laryngoscopists who are already trained to the use of the ophthalmoscopic mirror will abandon a plan to which, when once acquired, there can be no possible objection; but we can confidently recommend Dr. Johnson's method to those who are about to commence laryngoscopy.

As regards illumination, it may be remarked that an immense number of different kinds of lamps have been invented—indeed, almost every laryngoscopist has his special apparatus for concentrating the luminous rays. After examining a great number of these, we are inclined to give the preference to the lamp invented by Dr. Tobold. This lamp, or lantern, as it may perhaps be more properly called, is a small tin box, which has a round aperture in its upper and under surfaces through which the chimney of the lamp passes, and another opening opposite which there is a conical tube about five inches in length, having a diameter of two inches at its apex and three at its base. In this tube there are three lenses: 1st, a "collecting lens," two inches in diameter, which is close to the glass of the chimney; 2ndly, another collecting lens, which is placed close to the first, and separated from it by a narrow rim of metal; and 3rdly, an "illuminating lens" placed at the open extremity of the tube. The object of this arrangement of lenses is that the rays should not diverge too much before they reach the observer's eye, and the effect is that a magnificent disc of light passes to the reflecting mirror, whilst the rest of the room is kept in a state of darkness. The apparatus is especially adapted for the ordinary reading-lamps[1] which are to be found in most houses in Germany; and it is screwed to the perpendicular bar which exists in these lamps. The German reading-lamps can be fixed at any height desired, a circumstance very favourable to laryngoscopy:

"In the construction of my apparatus," observes Dr. Tobold, "I went on the principle of conducting as many rays as possible to the illuminating lens. To accomplish this, I brought the collecting lens as close as possible to the flame, as, according to the laws of optics, *the intensity of the light or the quantity of rays which falls on surfaces at different distances from a luminous object, is inversely as the square of the distances from the latter.* By this arrangement, however, the luminous rays passing out from the collecting lens diverged, so that only a small number reached the illuminating lens, which is five inches off,—the greater number of rays being absorbed and destroyed in the dark space between the lenses. To prevent this, and to concentrate the rays again, so that they fall on the illuminating lens, a second collecting lens is placed close to the first. The one-lensed apparatus[2] has only one illuminating lens about three inches in diameter, having a focal distance of about three and a half inches; the lens is fixed at a distance of three to four and a half inches in front of the lamp, behind which a reflector is placed. The reflector catches the posterior rays and throws them on to the illuminating lens, parallel with its axis, whilst the anterior rays at the same time pass to the lens. The action of the reflector, however, is very much weakened by the intervening lamp chimney,

[1] In this country these lamps are sometimes called "Pillischer's microscope lamps."

[2] Recommended by Dr. Voltolini and others.

and the intensity of the direct light falling on the illuminating lens is diminished by the distance of the latter from the lamp. The rays also fall in such different directions on the lens—some from the reflector being parallel with the axis, others from the lamp diverging—that the luminous disc loses in clearness. In order to establish mathematically the influence which the position of the lamp exercises on the brightness of the luminous disc, I will compare both systems. Let A represent the luminous power possessed by my first collecting lens, and B that of an illuminating lens in a one-lensed apparatus, which are placed respectively at a distance of $\frac{3}{4}$ of an inch and $4\frac{1}{2}$ inches from the lamp. Then

$$A : B = (\tfrac{9}{2})^2 : (\tfrac{3}{4})^2 = 36 : 1$$

But as the lens in the one-lensed apparatus has a diameter of three inches, and my collecting lens only a diameter of two inches, the surfaces are as 4 : 9 ; and

$$A_2^1 : B^1 = 4 \cdot 36 : 9.\ 1 = 16 : 1$$

Admitting that by means of the reflector the intensity of light in the one-lensed apparatus is doubled ; and

$$A^1 : B^1 = 8 : 1."$$

In this computation Dr. Tobold seems to forget that in the passage of rays through three lenses, a far greater absorption of light takes place than where only one lens is employed; and we do not see any reason why the large lens in the one-lensed apparatus should not be placed much nearer to the flame than four and a half inches. These palpable fallacies destroy the affected precision of Dr. Tobold's mathematical calculation; and we think that the chief objection to the one-lensed apparatus is its size and weight, and the greater spherical aberration caused by the larger lens. We have described Dr. Tobold's apparatus at some length, as we think it adapted for the consulting-room of those much engaged in laryngoscopy. Czermak, Semeleder, and many other distinguished investigators, still employ an ordinary moderator lamp; and it must be admitted that many of the most important observations both in physiology and pathology have been made with this simple apparatus.

The diagnosis of laryngeal disease has undoubtedly made great progress, and many morbid conditions have been proved to exist which were formerly scarcely suspected. The following case from Semeleder is an example of the certainty of diagnosis which is attained by the laryngoscope :

"A colleague lately brought me a patient who for a long time had suffered from hoarseness and dysphagia. Following professional advice, he had passed the summer in Gleichenberg, but had derived no benefit from so doing. He had recently consulted Türck, and was now brought to me, because Türck's diagnosis had not given satisfaction. I was informed, however, that Türck's opinion would not be told me until I had stated my own views. I found an extensive loss of substance affecting the left half of the extremely red and swollen epiglottis, a catarrhal condition of the larynx, and a jagged ulcer over the right arytænoid cartilage. I declared that according to the condition of things at the time, the case must be considered as one of syphilis; and I was thereupon informed that Türck had diagnosed it as syphilis. Through this unanimity the patient and his medical attendant were convinced, and they determined to adopt a plan of treatment in accordance with our views."

We do not know in this case whether the diagnosis was founded alone on laryngoscopic evidence, or whether there were any commemorative signs of venereal disease. If Drs. Türck and Semeleder were guided by the laryngeal mirror alone in forming their diagnosis, the case is of great interest; and we cannot help regretting that Dr. Semeleder did not describe more minutely the peculiarities of the ulceration, by which he recognised its syphilitic character.

The diagnostic signs are, moreover, very precise, not only where the mirror reflects the dark lines of structural alteration, but also in those cases stamped by the faint impress of impaired innervation. Numerous cases have been published, illustrating unilateral and bilateral paralysis of the glottis; and the ætiological features of the various nervous affections of the larynx have been carefully worked out. We may particularly refer to two cases of this kind, as being of more than ordinary interest. In a case of phthisis (No. 13 in the series) under Professor Gerhardt's care, paralysis of the left vocal cord was observed during life, and after death

"the left pneumogastric nerve was found imbedded in thickened areolar tissue; and behind the bronchial glands a melanotic lymphatic gland was found strongly adherent to the left recurrent nerve; the posterior crico-arytænoid muscle was much atrophied, being less than one-third the thickness of its fellow, and with the microscope it was seen to have undergone fatty degeneration. The recurrent nerve on the left side, at its entrance to the larynx, was smaller, and contained more areolar tissue and fewer fibres than its fellow."

The other case was of very similar character, and occurred in the practice of Dr. Türck:

"In May, 1862, a patient, aged fifty, who at an earlier period had been affected with hoarseness, and who since November, 1861, had suffered continuously from these symptoms, was examined with the laryngoscope. The left vocal cord was seen on inspiration to be near the median line, and firmly fixed in this position under all circumstances. The left capitulum Santorini and arytænoid cartilage were in the same immobile condition; and on coughing gently, the right capitulum Santorini passed in front of the left one, so that they crossed one another. Swallowing was very slowly performed, and regurgitation sometimes took place. The soft palate moved somewhat unsymmetrically. In February, 1863, the patient died from an attack of apoplexy. At the autopsy a large hæmorrhagic clot was found in the right thalamus opticus; there was atheromatous degeneration of the arch of the aorta, and hypostasis of the lungs. On the left side, the lateral crico-arytænoid muscle and fasciculus forming the external thyro-arytænoid were of a pale yellowish-red colour, and very much atrophied; the transverse markings could not be seen with the microscope, or at least they were only very dimly marked. The left crico-arytænoid posticus was only slightly atrophied. On the left side, the internal thyro-arytænoid—the special vocal muscle—was pale and much weakened. The left recurrent nerve in the vicinity of the larynx was likewise atrophied. As the superior laryngeal nerve, the vagus, and the origin of the spinal accessory in the pons Varolii, as well as the neighbourhood of the deep fibres in the spinal cord, were all healthy, Dr. Türck considered the disease peripheral."

These are the first cases in which the laryngoscopic diagnosis of a neurosis has been confirmed by post-mortem evidence; and independently of their value in relation to the laryngoscope, they are extremely interesting and important as illustrating the exactitude of medical science.

We have already shown that the diagnosis of diseases of the larynx is very precise, and we are happy to be able to say that the therapeutics of this region have already attained a considerable degree of perfection. There are many modes of applying remedies to the larynx, and laryngoscopists are not quite agreed as to their respective merits. Taking a general view of the subject, we may observe that there are two fundamental methods; these may be described as active and passive. The first, which embraces deglutition, gurgling, and inhalation, is practised by the patient; the second, which includes insufflation, and all modes of introducing remedies by means of brushes, sponges, and syringes, is performed by the practitioner. Our readers may be astonished that we should include gurgling, and still more deglutition; but on this subject we agree with Dr. Fournié, who is a strong advocate of this latter method of bringing medicated solutions to bear on the larynx. He makes the following observations with reference to this matter:

"Physicians, who pride themselves on their power of reasoning—very properly, no doubt, when they reason correctly—do not admit the utility of gurgling; and convinced of the non-penetration of liquids into the larynx, they derisively refer empirics to those fabulous times when Hippocrates and Plato believed that a portion of swallowed fluids passed into the larynx.[1] Nevertheless, in this particular the empirics are right, and we have been able to prove experimentally that a certain quantity of fluid can penetrate into the larynx, without causing any appreciable sensation. We are not speaking here of that accidental penetration which, when it takes place, causes a violent fit of coughing. . . . . With the laryngoscope, the pharyngeal liquid can be seen moistening the edges of the glottic opening, and always ready to invade it, especially at that point where the apices of the arytænoïd cartilages touch one another."

Dr. Fournié supports his views still further by a physiological experiment and a pathological observation:

"After swallowing a few mouthfuls of a rather concentrated solution of tannin, a pellet of cotton, saturated with a solution of iron, was introduced into the larynx with the aid of the laryngeal mirror. The solution was applied to the anterior surface of the arytænoid cartilages. The cotton had scarcely changed colour when it was withdrawn from the interior of the larynx, but an instant later it became black."

In the case of a patient whom Dr. Fournié examined at the Hotel des Invalides, he found, as he considered, another proof of the penetration of fluids into the larynx during deglutition. The patient was an old man, who presented all the symptoms of progressive paralysis. "His voice was not hoarse, but he spoke with difficulty." It happened accidentally that the old man had been eating some extract of liquorice just before he came under observation, and the interior of the mouth and pharynx were stained of a yellow colour. With the laryngoscope it was seen that "the yellow-coloured pharyngeal liquid had invaded the arytænoïds, and the yellow colour of the true vocal

[1] Galen, ch. ix. v. 3, des Dogmes d'Hippocrate et de Platon.

cords left no doubt as to the penetration of the liquid into the larynx." It is true that, in this case, the arytænoïd cartilages, instead of being approximated, were thrown back, so that their posterior surfaces were in close contact with the wall of the pharynx—a condition manifestly favourable to the penetration of liquids. Nevertheless, Fournié considers, and we think with reason, that this was only an exaggeration of what takes place in the physiological condition. We have dwelt at some length on these proofs of the penetration of liquids into larynx during deglutition, because cases must every now and then occur in which remedies cannot be applied directly to the larynx with the aid of the laryngeal mirror. For the introduction of medicated solutions to the interior of the larynx we have two kinds of instruments: in the first a brush or sponge is fixed at the end of a suitably curved rod of silver, aluminium, whalebone, or bone; the second acts on the principle of a syringe, though the details of its construction vary considerably. For the introduction of any instrument as far as the vocal cords, it is found convenient that its laryngeal extremity should be from two to three inches long, and that it should form a right angle, or rather more than a right angle, with the rest of the instrument. Brushes and sponges of different sizes should be employed according to the size of the larynx and the extent of diseased surface. For cases of limited congestion and ulceration, a brush or sponge is the best instrument, but when it is desired to introduce a considerable quantity of fluid into the larynx, a curved syringe may be advantageously used. It is not necessary to describe here the various laryngeal syringes which have been recommended by different authors; any syringe that works easily, and is provided with a properly curved tube, will answer the purpose very well; though Dittel, Fournié, Störk, and Semeleder each claim particular merits for the instruments of their own invention. Insufflation has been re-introduced by laryngoscopists, and powdered substances can now be applied with intelligence to the affected spot, instead of being blindly distributed in all directions but the right one, as was formerly the case. For this purpose Fournié, Störk, Gilewsky, and others, use a very simple instrument—a fine tube, properly curved, so that it can be easily passed into the larynx, is provided at its posterior part with a small receiver, or box, about the size of a chesnut; behind this receiver, into which the powdered substance is put, there is a long piece of elastic tubing, which terminates in an ivory mouthpiece. Guided by the laryngeal mirror, the powdered substance can be introduced into the larynx with the greatest certainty. We have lastly to mention a method of applying solutions to the larynx which has lately been largely employed on the continent—this is the inhalation of the so-called "pulverized liquids." The principle of the various instruments employed for this purpose is nearly the same in all, and consists in directing the pressure of several atmospheres upon the medicated solution in such a way that the latter is forced with great power through a long and very small-bored tube, from which it issues in a fine spray, or the atmospheric pressure may force the fluid through a fine opening in such a way that it strikes a small metal button, on which it breaks into a spray. The latter instrument is the more convenient, as by means of a glass cylinder "the pulverized liquids" can be passed directly into the mouth, whilst in the former the spray covers the face of the patient. The subject of the inhalation of pulverized liquids has been very carefully investigated by Dr. Lewin, and we venture to predict that this mode of applying remedies is likely to bring about a great reform in the treatment of pulmonary affections. In an article professedly devoted to the laryngoscope it is impossible to do justice to a subject of so much importance; but perhaps on a future occasion we shall be able to lay before the readers of this journal an account of what has been done on the Continent in this new department of practical medicine. An enumeration of the substances which have been brought to bear on the air-passages in this way by Dr. Lewin will give an idea, however, of the diligence with which this method has been tried: these are, cold water, chloride of iron, tannin, alum, nitrate of silver, tincture of iodine, iodide of potassium, iodide of glycerine, bichloride of mercury, bromide of potassium, hydrochlorate of ammonia, tar-water, liquor potassæ arsenicalis, hydrocyanic acid, extract of hyoscyamus, extract of conium, opium, glycerine, tincture of stramonium, digitalis, lobelia, &c. &c. All these substances have been used in a great number of cases, the records of many of which are given in Dr. Lewin's work.

For the application of solid nitrate of silver to the larynx, a great number of caustic-holders have been invented. Drs. Czermak and Lewin use a piece of curved silver wire, which is roughened at the end, and then dipped into nitrate of silver fused over the spirit-lamp. Only a small quantity of the nitrate adheres to the wire, but it adheres so firmly that there is no chance of its falling into the windpipe. We have shown how the inventive faculties of the profession have been directed to the discovery of the best mode of applying remedies to the larynx, but for the removal of morbid growths a still greater number of instruments have been contrived. The subject of morbid growths has been treated by laryngoscopists with a preference which is to be explained—not by the frequent occurrence of the disease, but by its presenting those inherent difficulties which are so frequently found to attract. In denying that new formations are of very common occurrence, we are, of course, speaking of them in relation to other morbid conditions of the larynx; for those who have not paid special attention to this department of pathology will, we think, be greatly astonished at the absolute frequency of morbid growths in the larynx.

In 1851, Erhmann published an account of 31 cases of laryngeal polypi, two only of which had come under his own notice; 10 cases more were added by Rokitansky in 1852. Meddeldorpff, in his 'Galvano-Caustic' in 1854, brought together 64 cases, and Lewin from various sources has lately collected 80 cases. Of these 80 cases, only three or four had been diagnosed during life, and only twice had the morbid growth been removed, once by galvanic-cautery and once by division of the thyroïd cartilage. In another case, which has escaped Dr. Lewin's notice, a polypus, which on forced expiration could be seen projecting above the epiglottis, was seized by Dr. Horace Green with the ordinary tonsil forceps, and then divided with a bistouri. Since the introduction of the laryngoscope, more than a hundred cases have been published in which morbid growths have been found in the larynx. Fifty cases have come under the notice of Dr. Lewin alone, and the joint observations of Drs. Czermak, Türck, Moura Bouronillon, Semeleder, and others, make up another fifty. In England a good many cases have also been inspected. Now, admitting that in some of these cases errors in diagnosis may have been made, admitting that a swelling of the mucous membrane may have sometimes been mistaken for a tumour, there still remain an immense number of well-authenticated observations, which show that morbid growths are far less rare than was formerly supposed. The fact that morbid growths were seldom diagnosed in præ-laryngoscopic times is not at all remarkable when we recollect how vague were the symptoms and how obscure the signs. The former consisted in cough, dyspnœa, loss of voice, and pain in the larynx, and, as regards the signs, a peculiar "ventricular bruit" was sometimes heard or imagined over the larynx. The paroxysmal character of the cough and dyspnœa were the most important and reliable symptoms; but even these were not always present, and were sometimes observed in cases where there was no tumour. The expectoration of particles was the only sure evidence of the existence of a new formation, and even then there was no proof as regards the site of the tumour. Since the laryngoscope has been employed in the practice of medicine, a complete revolution has been effected, not only as regards diagnosis but also in reference to treatment. For the removal of morbid growths from the larynx there are two modes of treatment: these are extirpation and cauterization; or they may be combined, the morbid growth being first cut or torn away, and its base being afterwards destroyed by caustics. The extirpation may be effected by cutting or tearing instruments: the former is accomplished when scissors, knife, or écraseur are employed; the latter when the forceps are used. It need scarcely be observed that all these instruments require to be of peculiar construction, and curved in a particular way; each case, moreover, may almost be said to require a special instrument. Forceps seem to be generally preferred on the Continent, and the wire-loop, though appearing to offer some advantages, is now pretty generally abandoned. The difficulty of removing morbid growths from the larynx, which under all circumstances is great, depends upon their site, size, and character. When moderately large and pedunculated, and when seated in the epiglottis or arytænoïd cartilages, they are much more easy to seize than when small, broad-based, and growing near the anterior insertion of the true cords. The following case of Dr. Bruns shows what enormous trouble must be taken to bring about a satisfactory solution, and how great must be the perseverance both of the patient and the practitioner.

"Theodore Bruns placed himself under the care of his distinguished brother in May, 1861. About two years and a half before this—that is to say, in October, 1858—he had been taken with a cold and cough, and hoarseness of voice. After a few weeks, the catarrh passed off, but the hoarseness remained, and the patient was constantly troubled with either a burning or tickling sensation in the throat. The dysphonia gradually passed into complete loss of voice, and though the patient underwent many plans of treatment, he did not get any better. Under these circumstances, he placed himself under his brother's care, determining to submit to anything rather than suffer the many inconveniences arising from loss of voice. With the laryngoscope, Dr. Bruns had already diagnosed a polypus in the larynx, and he now made a very careful examination with the mirror. The polypus was somewhat club-shaped, one side of the club being attached by a fold of mucous membrane passing from before backwards from the lowest edge of the left vocal cord, or, as Bruns says:—'The club-shaped growth was contained in a fold of mucous membrane in the same way that the intestine is enclosed in the peritoneum.' By artificial light the polypus appeared yellowish, and when sunlight was employed, it looked white and transparent, and was marked by small specks and by bluish-red lines; it seemed to resemble the ordinary mucous polypi found in the nose. In order to get at the polypus, it became necessary to draw forward the epiglottis. Dr. Bruns attempted to accomplish this by applying a curved metal probe to the centre of the upper free edge of the epiglottis. This procedure was found to produce great irritation, and was therefore obliged to be abandoned. Bruns finally succeeded in raising the epiglottis, and in drawing it forwards with a pair of forceps which he had made for the purpose. The employment of this 'pincette' caused no irritation, but it sometimes gave rise to a small wound, and always to a heavy stabbing pain. By occasionally using the forceps, and sometimes introducing the curved probe, *the epiglottis took up the right position when the probe was put near it, without touching it at all.* With a curved piece of wire, Dr. Bruns now practised touching the polypus, and in this way he was able to fix upon the angle most suitable for the instrument he intended to employ. To remove the growth, Dr. Bruns first tried to use a wire-loop, a plan which he was induced to try from having employed an instrument of this sort (through the opened trachea) in a case of tracheal polypus. The wire-loop, however, in its passage over the vocal cords, caused so much irritation, that Bruns gave it up, and had an instrument made, at the extremity of which was a sharp concealed double hook; there was also a small two-edged blade (also concealed), which sprang forward and divided the growth, after it had been seized by the hooks. With this instrument he was able to seize the growth, but when he attempted to divide it, it caused coughing. He finally had a 'polypotome' constructed, and with it he succeeded in destroying the polypus. This instrument is a kind of pair of scissors bent at right angles, the branches of which cross over one another, and are closed by the pressure of the finger at the handle; the minute blades of the instrument, the cutting edges of which are opposite one another, are again placed at right angles to the extremities of the branches. The instrument is introduced into the larynx closed, and the blades are not opened till they have passed the epiglottis. On the 20th July, 1861, he first made three little incisions in the polypus. No pain was caused by the operation, but the patient spat up about two ounces of blood. On the 21st and 22nd, the operation was repeated, and each time there was less hæmorrhage. After these operations, the polypus was seen covered with little wounds and bloody coagula. On the 23rd it was converted into a dirty-greyish mass of small size and somewhat gangrenous appearance. The patient now began to speak better. In the beginning of August, the patient was able to speak perfectly. The remains of the polypus (a minute stump) was to be seen just below the anterior insertion of the vocal cords. During the progress of the cure, the patient's health, which up to that time had been good, suffered very much. After each operation, he had cold sweats and shivering, and there was so much irritation of the stomach, anorexia, exhaustion, and fever, that for some weeks he was confined to his bed."

We have given this case at some length, because, independently of its being one of the first—the very first, as Dr. Bruns asserts—in which an excrescence has been removed with the aid of the laryngoscope, it shows the immense perseverance which is required to extirpate a laryngeal polypus. In the whole range of surgery there is not a more delicate nor more difficult operation. In Bruns' other case, which was published as a sequel to the first, the patient, a pastor at Haarlem in Holland, had travelled a long way to place himself under Dr. Bruns' care, and he was well rewarded for his pains. A polypus, or rather excrescence, about the size of a pea, on the free edge of the left vocal cord, had previously been diagnosed by Dr. Huet, of Amsterdam. The patient first came under Dr. Bruns' care on the 22nd of December, 1862. He was not able to use his polypotome in this case, and he attributed his want of success "to the extremely small size of the growth, its broad base, and its situation (so difficult to get at) on the left vocal cord, very near to its anterior insertion." He finally succeeded in stabbing the polypus through its base, from before backwards, with a very fine double-edged sharp-pointed knife. The blade of this knife terminated one extremity of a slender steel rod suitably curved, the other end of which widened into a broad roughened handle. On the day after the operation, in place of the polypus, a small greyish-yellow excavation, with raised edges, was seen. Directly after the operation, the patient's voice became clear and strong, and on the 8th February, 1863, he was again preaching at Haarlem.

In justice to Dr. Lewin, we must mention that he claims to have operated on a laryngeal polypus, almost a year before Dr. Bruns. The following was Dr. Lewin's first case :

"A merchant, aged thirty-three, had had syphilis six years before, but had never suffered from any secondary symptoms; for the last four years he had been extremely hoarse, and had suffered from shortness of breath and a constant violent cough. A broad-based excrescence about the size of a raspberry was seen, attached to the anterior half of the left vocal cord. The growth projected across the glottis, and interfered with the movements of the right vocal cord. After using several anti-syphilitic remedies without effect, in July, 1860, that is a whole year before Bruns' case, Lewin first essayed to operate. He first tried to employ an ordinary throat forceps, and afterwards a special laryngeal forceps; with the latter instrument he succeeded in removing several portions of the growth. The voice became clearer and stronger, and the dyspnœa quite gave way. Later, the polypus grew again, but the patient would not submit to a radical operation."

Many other cases of new-formations in the larynx have been operated on by Dr. Lewin, and most of them with perfect success. Some of the excrescences were removed by instruments, others destroyed by escharotics. The instruments he uses are three : (1) The ordinary throat forceps, slightly modified so as to have cutting teeth. (2) A polypus forceps: it consists of a flexible piece of wire, the anterior extremity of which terminates in a "pincetto" of steel; the instrument has somewhat the shape of a pistol, and is held like that weapon. By passing the thumb through a ring, and pressing it forwards, an elastic spiral passes over the wire, and closes the blades of the pincette. (3) A pair of polypus scissors: these are bent at right angles, and the sharp blades are provided with four small claws, which seize the polypus and prevent it falling into the trachea. For cauterization, nitrate of silver in the solid form can be used in the manner already indicated. Nitric acid is a more effective remedy, but its application is attended with more danger.

Before dismissing the subject of laryngeal therapeutics, we must not omit to mention that the electric current has been brought to bear directly on the vocal cords by Dr. Morell Mackenzie. A very simple, and apparently very effective instrument has been invented by that gentleman for the treatment of nervous aphonia. In some of the cases contained in that author's pamphlet, the loss of voice had existed as long as three years, and external electricity had been ineffectually tried; faradisation directly applied to the vocal cords soon restored the voice.

It is not necessary to criticize the works at the head of this article which refer only to special classes of laryngeal disease, but in a subject of such recent origin it may be useful to analyse those which refer to laryngoscopy in general. The first edition of Dr. Czermak's work is so favourably known to the English public through the New Sydenham Society's translation, that we have little to say on its merits here. The second edition has been carefully revised, the physiological observations extended, and a further addition has been made of a number of pathological cases. Special attention has been paid to the technical aspect of laryngeal therapeutics, and there is now an interesting chapter on "Polypi and Epithelial Growths in the Larynx." This book is the type of what a scientific work should be.

We have already (vol. xxx. p. 124) criticized the English version of Dr. Türck's work, and we shall therefore only briefly refer to it now. The French edition has been *francisé* by M. Ernest Fritz, and though the style is not pleasant, it is free from the funny blunders which abound in the English translation. As Dr. Türck's work contains a great deal of information, we should be glad, both for his sake and for that of laryngoscopy in England, that it should be at least sufficiently Anglicised to be generally read.

Dr. Fournié's work is free from all pedantry, and though it does not enter very fully into laryngoscopy, it contains some very sensible remarks on the treatment of laryngeal disease.

Of Dr. Semeleder's work we cannot speak too highly. It not only contains a great deal of original matter, but is an admirable *résumé* of all that has been made out with the laryngoscope, since its application to practical medicine. The mode of using the laryngoscope, the best way to overcome the different difficulties that may occur, the most satisfactory method of applying remedies to the larynx, are all described in a manner that leaves nothing to be desired.

Dr. Tobold has written a very good manual ; it is clear and concise, and calculated to be very useful to the actively-engaged practitioner.

Confining ourselves on the present occasion to the notice of works on the laryngoscope published abroad, we hope on a future occasion to draw attention in a more systematic manner to Dr. Mackenzie's pamphlet, and also to a work recently brought out by Dr. Gibb, entitled, 'On Diseases of the Throat and Windpipe, as reflected by the Laryngoscope;' also to an able paper by Dr. Smyly, of Dublin, 'On Cases of Aphonia Cured by Internal Galvanism.' The consideration of these English works will strengthen the persuasion which cannot but arise from the notice which we have given of the various works which have appeared on the Continent on the use of the laryngoscope, that we have therein an instrument by which not only our diagnosis but our therapeutic efforts may be greatly enhanced.

PART SECOND.

Bibliographical Record.

ART. I.—*Practical Lithotomy and Lithotrity; or, an Inquiry into the Best Means of Removing Stone from the Bladder.* By HENRY THOMPSON, F.R.C.S., &c.—*London*, 1863. pp. 274.

MR. THOMPSON'S name is sufficient guarantee of the excellence of any book of his on the treatment of stone. We will not, therefore, waste our reader's time by the encomiums which we might otherwise most justly bestow upon this excellent practical treatise. Our task will be confined to pointing out what we have found most worthy of remark or most original in its pages, and to detailing, as well as we can, to our readers the doctrines on the subject which are here explained by a scholar and an able follower of the illustrious inventor of modern lithotrity, M. Civiale.

Mr. Thompson's work consists of two different parts, as indicated by its title, and we shall discuss the two parts separately. In the first part, Mr. Thompson describes all the cutting operations for removing stone from the bladder. As the work is intended to be complete, of course a good deal of space is consumed in a description of the anatomy of the perinæum, and in a catalogue of the instruments which are and have been used in lithotomy. We shall not detain the reader on this head further than to remark upon the anatomical description, that it is well and clearly written, and forcibly shows the great advantage which lateral lithotomy has over all the other operations practised in the perinæum—viz., that it gives the greatest amount of room which can be obtained without wounding important parts (*see* the figure on p. 40). In the description of instruments, we note that Mr. Thompson, without going so far as to recommend the use of the cutting gorget, yet speaks of it (at least of the form used by Cline and Green) in terms which show that he thinks well of an instrument now rarely seen and well-nigh abandoned (*see* p. 35). Of the bistouri cachée, too, Mr. Thompson speaks without reprobation, rather to our surprise, as we must own. Most of the misfortunes which we have ourselves witnessed in the operation have proceeded from the operator changing his instruments, and of all instruments the bistouri cachée seems to us the most liable to go in a wrong direction, an accident which we have seen occur with lamentable results. Mr.

Thompson does not say, however, as far as we have observed, that he himself uses anything except the scalpel, unless in the following exceptional circumstances. After stating (what we believe few surgeons of the present day would question) that the common scalpel is usually superior to any other instrument, Mr. Thompson goes on to say:

"But, on the other hand, there are circumstances, and by no means unfrequent ones too, in which I believe the probe-pointed knife is superior. When the stone is large, and the deep incision must therefore correspond to it, the latter is then a safer instrument, since its point leaves the staff in that act.[1] When the perinæum is deep, as in very stout subjects, and in those suffering from enlarged prostate, so that the finger cannot follow the knife as far as to the neck of the bladder, I decidedly prefer the probe-pointed knife for the last incision, as well as the blunt gorget to dilate it, and conduct the forceps into the bladder. (p. 39.)

Mr. Thompson also describes the straight staff (so called), and the method adopted by Mr. Key for performing lithotomy, as that which is still followed at Guy's Hospital; but he omits to inform the reader why an operation so much more difficult than ordinary lithotomy has been devised and adopted. The reason we believe to be that, although the preliminary parts of the operation—that is to say, the finding the groove of the staff, and lodging the knife securely in it in the proper position—are much more difficult than in lithotomy with the ordinary staff; yet when these steps are once accomplished, the later stage of the operation, which consists in pushing the knife into the bladder, is believed to be effected with less risk of the point slipping below the prostate, and it is in these later stages that the more formidable dangers of the operation are met with. Of the less usual methods, Mr. Thompson gives as full an account as can be desired. As to the median operation, which has been recently revived by Mr. Allarton, and which was regarded a short time since as a great improvement in surgery, Mr. Thompson says a great deal, and appears to have practised it often; but we cannot find in this work any distinct opinion as to its value in relation to the lateral operation, or its applicability to particular cases, except at p. 236, where Mr. Thompson says that in healthy adults, when the stone is of no great size, "if there is any special or exceptional ground for rejecting lithotrity, some form of central perineal operation is well adapted to them: the median if the stone is small, the medio-bilateral if it is of full medium size;" and "in feeble and diseased patients . . . . if of medium size . . . . and hard and compact in structure . . . . median or medio-bilateral lithotomy would probably afford better results" than lithotrity; but he does not state any decided conviction that it would afford better results than the lateral operation.

The consideration which, if we understand rightly, was originally used to recommend the operation popularly, though incorrectly, called "Allarton's operation," was that it involved no incision into the neck of the bladder. This Mr. Thompson regards (and we believe with great justice) as a drawback instead of an advantage.

[1] This sentence is not written with Mr. Thompson's usual perspicuity.

"Mr. Allarton has recommended, if the finger is insufficient for the purpose (i.e., of dilating the wound), the use of Dr. Arnott's hydraulic dilator; and Mr. Teale, of Leeds, has designed and employed a branched metallic director. I cannot, however, concur in advising the employment of mechanical force in dilating the structures forming the neck of the bladder, believing it far safer to make an additional section when necessary." (p. 61.)

"The anatomical axiom must not be forgotten, that any operation, the incision of which is altogether in a line above the anus and below the symphysis pubis, unless aided by a lateral section, never can afford an opening sufficiently capacious for the removal of very large stones, without dangerous laceration." (p. 63.)

"The eleventh case is an example of median lithotomy in a child. I know of no advantage it possesses above the lateral operation at this age." (p. 258.)

Again, on p. 260, Mr. Thompson dissuades the application of median lithotomy to cases of enlarged prostate, while at the same time he intimates an opinion that the operation is "valuable for the adult with a healthy prostate." But surely, if all cases of children are to be excluded, and all those of adults in whom the existence of a large stone or an enlarged prostate is proved or probable, the range for the application of Allarton's operation must be very limited, and must be limited precisely to those cases where no improvement on the lateral operation is wanted. Though we could have desired that Mr. Thompson had spoken a little more plainly about this matter, we gather from what he has said that he regards the median operation as being, on the whole, no great improvement on the lateral. Dr. Buchanan's operation with the rectangular staff is also described, and in intelligible terms, from a French description, which, strangely enough, is the only intelligible account which Mr. Thompson could find. We confess, with our author, that "until we became acquainted with the latter, we had not a correct idea of the proceeding," (p. 64.) On supra-pubic lithotomy Mr. Thompson gives such details as are necessary, but has not had any personal experience of this rare operation. Valuable, however, as the chapters of Mr. Thompson's work on the various forms of operation are, they are, to our mind, much exceeded in value by the observations which he makes on the causes of death after lithotomy—the most original, practical, and instructive chapter in the whole book, in our opinion. Mr. Thompson teaches, and to our minds with overwhelming force, that the great danger of the operation proceeds from laceration of the parts around the neck of the bladder, in extracting the stone through an insufficient opening. After pointing out how this accident may occur, Mr. Thompson goes on to speak in the following terms of the opposed condition, in which death is produced by infiltration of urine through too extensive incisions.[1]

[1] It would be uncandid, however, to pass over the fact, that lithotomists of the greatest experience are of an opposite opinion. Thus Dr. Humphry, of Cambridge, in a paper published in the 'Lancet' for April 23rd, 1864, states expressly that he always makes as small an incision as practicable; and that he has reason to think that Martineau usually made a very small incision into the neck of the bladder, and sometimes none at all.

"Death after lithotomy may result from rapidly spreading inflammation produced by urinary infiltration into the cellular interspaces between the pelvic viscera, when they have been opened up by too deep incisions. This result, though undoubtedly occurring sometimes, does so much less frequently, I believe, than is usually supposed. It is true that at a post-mortem examination, after a large stone has been with difficulty extracted, the cellular connexions of the neck and base of the bladder are found to be broken up; sloughs of the connective tissue appear, bathed in fluid sero-purulent and urinous, and marks of peritonitis, especially severe in the pelvis, are observed. But there is good reason to believe that, in most cases, urinary extravasation is not the primary cause of the inflammation, but that inflammation has been the occasion of the urinary extravasation. Cellulitis, produced by violence, has first destroyed the connexions in the manner described above, and then the urine has rapidly infiltrated the disintegrated tissue. . . . . To judge from the language held respecting this subject, one would imagine that hollow intervals existed between the organs in question, over which urine had only to be poured in order to drain mechanically into them. No such thing exists. In the child, where the cellular connexions are of the loosest and most delicate kind, and where the bladder is active, powerful, and irritable, urine flows constantly after this operation over a cut surface, which affords free access to them; nevertheless, with what extreme rarity do we meet with urinary infiltration in the child! But once inflame this cellular tissue, destroy its healthy character, or even, perhaps, let the patient be of unsound health, or one in whom 'the flesh never heals well,' to use a common phrase, and then we have the condition in which urinary infiltration may take place." (pp. 87, 88.)

Another excellent feature of this portion of Mr. Thompson's treatise is the care with which he separates from each other the causes of death in children and in adults, and the clear manner in which he has described those of the former class.

Before quitting the subject of lithotomy, we may notice that Mr. Thompson throws much doubt upon the statement, which is frequently heard from operators, that calculi are adherent to the bladder. There is little doubt that this statement is in the great majority of cases unfounded. Still, Mr. Thompson goes a little too far when he says (p. 122), that the statement does not rest upon post-mortem authority. If it had been a part of his duty, as secretary to the Pathological Society, to commit their 'Transactions' to memory, he would have recalled one indubitable instance recorded by Mr. Shaw (vol. vi. p. 250), not to mention another by Dr. Van der Byl (vol. ix. p. 296), which might be explained away, perhaps, as being little more than a case of incrustation; and one by Mr. Mitchell Henry (ibid. p. 342), which, though only an account of an operation on the living subject, seems more reliable than most of such accounts. We can have little hesitation, however, in accepting Mr. Thompson's doctrine that the occurrence is not nearly so common as it is sometimes said to be.

In lithotrity, Mr. Thompson is avowedly a pupil and follower of Civiale, and the method to which he gives his adhesion is that which Civiale has devised, and which is popularly known as the French method, in opposition to that recommended by Sir B. Brodie, in his 'Notes on Lithotrity,' in the 'Medico-Chirurgical Transactions,' and which is distinguished as the English method. We cannot affect to have any right to speak on this subject from personal experience, as we have never practised the French method. Both are known and allowed on all hands to be efficient, and, in experienced hands, most successful. The main difference between them is one which is most clearly brought out in Mr. Thompson's work, where both methods are fully described. The passage is too long for quotation, but its study is most desirable—we had almost said essential—for all surgeons who are commencing their practice in this operation. The essential difference between the two methods is this—that in the English method the lithotrite is passed down into the floor, or bas fond, as it is called, of the bladder, and is then opened, in order that the stone may (as it usually does) fall into its jaws. If it does not do so, other parts of the bladder are searched in the same way; the principle, as Mr. Thompson puts it, being "to place the crushing instrument in a position presumed to be advantageous, and to bring the stone to the instrument in almost any way, rather than apply the instrument to the stone." (p. 172.) In the French method, on the contrary, the instrument is inclined away from the stone, when the position of the latter is known, its blades are opened, and then applied to the stone; or if the position of the stone be not known, the bladder is searched in certain definite directions and positions with the opened instrument, in order, as before, to apply its blades to the stone. The object of the former method is to avoid searching for the stone; that of the latter, to avoid contact (all contact, if possible, or, at any rate, all but the slightest) with the walls of the bladder. If it is advisable for us to give an opinion on a point where the opinions of the most competent persons differ, we should think that the English method was the safer, except in very experienced hands, but that, in such hands, the French method would be the more expeditious, and the less painful. In the hands of practised lithotritists, we cannot think that there would be much difference in the results of the two methods. As to the practice of removing the fragments with the lithotrite—a practice which, having been abandoned, is now re-introduced by Mr. Fergusson, and recommended by him in the course of lectures lately delivered at the College of Surgeons—Mr. Thompson has some remarks so excellent in themselves, and so excellently worded, that we cannot resist quoting them:

"Calculous matter, in a state of powder, will come away of itself more easily than you can remove it; fragments too large to pass the urethra will remain behind, do what you will; fragments small enough to pass with some difficulty should be left to take their chance at first, since if the bladder is unduly irritated by repeated instrumentation for their removal, some of them will be driven by its involuntary action into the neck of the bladder and urethra with violence. On the other hand, if the bladder remains quiet, they will probably not pass until after a day or two's sojourn in the viscus, their sharpest angles have been worn down a little, when they may be trusted to find their own way safely enough. A meddlesome disposition is not less prejudicial here than in any other department of surgery. If crushing is properly practised, we shall act wisely in mainly committing to nature the task of removing the product. Over haste, or undue anxiety to see or to display the results of our work, both tend to defeat the ultimate success of the operation." (p. 182.)

All the minutiæ of the operation are described in this book certainly better than we have seen them elsewhere, and what is perhaps even more beneficial to a student than a clear description, the reason and object of each of these minutiæ is clearly explained; why such and such a position is to be chosen; what is the advantage of such and such an instrument; why Mr. Thompson considers it better to act in the natural contents of the bladder rather than to distend it artificially with an injection; at what stages of the proceeding great or small quantities of fluid are necessary; and, in fine, every step of the operation from its first contemplation to its final close, is explained with so constant a reference to intelligible first principles, that the reader, whether in all cases he agrees with Mr. Thompson or not, can in no case fail to understand him. Some chapters on the statistics of lithotomy (for of lithotrity hardly any available statistics exist) and on those of stone, as to the ages at which it occurs, &c.; on the proceedings applicable to various cases of stone; and one containing an account of cases intended to illustrate and enforce Mr. Thompson's doctrines, close the volume. We shall conclude this imperfect notice of Mr. Thompson's work by one short extract from the part where he is speaking about the respective provinces of lithotomy and lithotrity. It contains in a few words the most important consideration which surgeons, or rather which medical men ought to have in their minds in the treatment of urinary disorders:

"By some, I am aware, I shall be charged with limiting the application of lithotrity. No doubt, more is *possible* by that process. I doubt whether it is prudent to push it further. *It must be our aim to reduce the stones to the process; that is, to detect them early, and consequently small, rather than to extend the process to large and compact stones.*" (p. 241.)

A thoughtful and diligent application of this doctrine would do more to save life than any improvements in the mechanical treatment of stone can do. We should never forget that stone is the cause, as well as the effect, of abiding and often rapidly fatal disease.

Art. II.—*A Handbook of Uterine Therapeutics.* By E. J. Tilt, M.D. Second Edition.—*London,* 1863. pp. 318.

Dr. Tilt is the well-known author of several good works on uterine diseases, and that to which we now refer—one which has rapidly passed into a second edition, and also been translated in Germany—well deserves attentive perusal. In a concise and readable form it discusses the various modes of treating affections of the womb, and the several agents employed for the purpose. To the young practitioner it will be found a useful guide in the choice and mode of application of the different therapeutical means employed in the treatment of uterine complaints, and we especially recommend attention to the remarks of the author in the chapter devoted to the consideration of the use of caustics. There can be no doubt that much evil, as well as much good, has resulted from the use of caustics in the treatment of uterine diseases. It is by no means a matter of indifference what particular kind of caustic is employed, one form of disease requiring this, and another that; neither is it at all safe to use caustics in every form of inflammatory affections of the womb. Very careful observation is required in order to distinguish the true nature of the case we have to treat, and when we have satisfied ourselves on this point we cannot be too careful in selecting and applying the proper remedies. We strongly suspect that caustic applications to the os and cervix uteri are too frequently used, and therefore often abused, from a prevailing notion of their efficacy. They are the fashion, so to speak; and like most other fashions, this has overstepped the bounds of propriety, and exceeded the limits of usefulness and safety. At p. 161, Dr. Tilt has offered some observations on the syphilitic diseases of the womb, which he believes to be much less frequent than has been supposed by many writers. He observes that syphilitic affections of the womb have distinctive characters, and should not be confounded with the non-specific lesions with which they are frequently associated; that

"they are very rarely met with in ordinary practice; that of all the syphilitic diseases of the neck of the womb, the true Hunterian chancre is the one most frequently met with; and as in nineteen cases out of twenty chancre on the neck of the womb is accompanied by chancre on the external organs of generation, the diagnosis is singularly simplified. . . . . Secondary affections of the womb are much less frequently observed—I mean mucous tubercles, similar to those better known to appear on the velum palati, roseola, and a papulo-squamous eruption similar to what appears on the skin. Tertiary symptoms are even still more uncommon on the neck of the womb."

He also remarks that

"Mercury and the exigencies of a prolonged treatment are powerful debilitating agencies; and thus one can easily understand that syphilitic women, more frequently than others, suffer from uterine catarrh, which is not at all syphilitic, and from ulceration of the os uteri, which is no more syphilitic than the soreness of the nostrils caused by coryza."

The ninth chapter treats of uterine displacements, their consequences and treatment, and contains many valuable suggestions; but our author seems to display a little inconsistency in his reasoning, for he first states his belief that the displacement theory is an absolute fallacy, and that, with the exception of prolapsus, uterine displacements have no proper symptoms, and yet writes about them as if they were important facts and causes of suffering, and offers very judicious observations as to how to treat them. His text is, "There are no pathognomonic symptoms of uterine deviations;" but his discourse describes all the ill consequences produced by them, and the most judicious and approved methods of relieving them.

This useful little work ends with a *Select Formulary* in which the author has "endeavoured to substitute definite quantities of valuable remedies for the uncertain preparations sometimes used, and to suggest inoffensive preparations in the place of some that are needlessly filthy."

That this is a worthy object of professional study no one will deny; and although hitherto a great deal too much neglected, it is one whose successful accomplishment will be immensely appreciated by the sick.

ART. III.—1. *As Inoculações Syphiliticas e Vaccino-Syphiliticas, sua Prevenção, Diagnostico e Tratamento.* Pelo Sr. HENRIQUE LEE. Traduzido da Segunda Edição pelo Dr. J. A. MARQUES, Cavalleiro da Ordem de Christo, da de Nossa Senhora da Conceicão de villaiviçosa, &c., &c. Two vols.—*Lisboa,* 1864. 12mo. pp. 325.

Lectures on Syphilitic and Vaccino-Syphilitic Inoculations, their Prevention, Diagnosis, and Treatment. By HENRY LEE. Translated into Portuguese by Dr. J. A. MARQUES.

2. *Os Banhos Turcos e as suas Applicações à Hygiene e a Therapeutica conformeas investigações feitas nos Estabelecimentos Existentes em Inglaterra.* Pelo Dr. J. A. MARQUES.—*Lisboa,* 1863. 12mo, pp. 88.

Turkish Baths, and their Hygienic and Therapeutical Applications, as in Present Use in England. By Dr. J. A. MARQUES.

THE advantages which accrue to a country from its relations of political fraternity do not limit themselves to exchange of commodities and mutual support; such ties occurring between communities different in race and distinct in prejudice, serve in many ways, by interchange of views and experience, to modify habit and opinion, and seem as so much superadded to the more naturally-adopted or engrafted ideas which are spontaneous to the soil. France, in its leadership of Latin thought, asserts a recognised priority to a hearing among all participators in that language and that blood, and easily finds the claim allowed. Thus in Portugal, as in the South of Europe generally, it has seemed natural that French medicine should dominate and keep possession of the stage until a sterility which wearies, or a fragility which tempts opposition, gives opportunity for the introduction of the best-esteemed and most freely-offered exotic truths.

It is in this sense we interpret the spirit of the prolegomena which usher in the translation of Mr. Lee's book. One gets fatigued at hearing Aristides called the just; in like manner the praise of Ricord, and the blind adoption of his discoveries, were at one time actually insupportable. His precipitancy, his *fiat lux,* heightened as they were by general acclaim, became really somewhat more than human nature (judging from our own) could bear. Summoned not to verify, but merely to corroborate his views, as in principle uncontrovertible, many of Ricord's cotemporaries, no doubt, deeply felt their infeinferiority in the scale; and thus it came to pass that in the same locale, in the very same field of teaching in which he had triumphed, heresy ensued. Vidal de Cassis, and after him Cullerier, Langlebert, Rollet, Robert, Diday, and especially in the Academy of Medicine, Gibert, showed themselves among the most refractory of his countrymen, and gave an example of dissent which shook opinion both in French and foreign schools. And yet how much ability, how much excellence in the man! how much candour! what an impulse, from his intelligent and attentive survey, has not syphilography received! Truly it may be said of Ricord that he was of a "free and open nature." The *situation*, too, as Dr. Marques expresses it, contributed to vanquish opposition, and to give to his doctrines a marvellous immediate success.

That Ricord first worked upon the plan of Hunter, especially in employing Hunter's method of verification by inoculating the secretion of "primaries," may be fearlessly asserted. Dr. Marques expatiates admiringly on the independent progress of investigators in the English school in succession to Hunter and Abernethy. Such were Carmichael, Wallace, Judd, Bacot, and many others, whose labours, he asserts, culminate in Henry Lee, as their chief representative and living interpreter. We do not require to be told in what particulars Mr. Lee has claims peculiarly his own, which establish him as an original observer, and invest him with a merit which is distinct. He also, in the work we are considering, first made known to us those occurrences at Rivalta which, occurring as they did in a remote Neapolitan village, are of a character as startling in their pathological results as engaging in their recital. If, as De Stael has said, one may read future fame in the verdict bestowed on us by our foreign contemporaries, Mr. Lee may take occasion to congratulate himself on the reproduction of these lectures of his in other languages of Europe than his own.

Of the literary production comprised under our second heading we will merely say that its completeness warrants the opinion we already have entertained of the enterprise and intelligence of Dr. Marques. We indeed seem to recognise the pathological views which may have interested him in this double line of study and observation. To render the skin active and facilitate excretion, may serve for alleviation of more than one morbid condition of the frame, besides the benefit to the function of the organ itself. We find the names of many old acquaintance in the pages of the work, but somehow miss that of Mr. Urquhart, who did so much towards introducing this particular bathing process into Britain. If talent is a title to admission, no name has a prior claim to his; if exaggeration must exclude, the gate would be shut on more than him.

Art. IV.—*Clinical Researches on Auscultation of the Head.* By M. Henri Roger, M.D., &c. Translated from the French by Alfred Meadows, M.D., M.R.C.P.—*London*, 1863. Pamphlet.

Drs. Fisher and Whitney, of Boston, U.S., as far back as the year 1838, published the results of their observations with reference to the application of auscultation to the diagnosis of diseases of the brain. Dr. Fisher described a *cephalic souffle*, audible in chronic hydrocephalus, cerebral congestion, acute inflammation of the encephalon and its membranes, abscess of the brain, and induration of that organ. To these morbid states, in which auscultation detects the *cephalic souffle*, Dr. Whitney added "scirrhous transformation of the cerebellum, and mechanical compression of the brain." He perceived, or imagined that he perceived, "a *cerebral ægophony* in hydrocephalus; a bruit similar to the *catarrhal fremitus* in aneurysm of the arteries at the base of the brain; and finally, he points (and with reason, in certain cases, adds M. Roger) to the existence of a *cephalic souffle* in anæmia of the brain, and also in chlorosis."

These observations having met with little regard, or having elicited negative conclusions in Europe, M. Roger set about the task of studying cerebral auscultation, in order to test the accuracy of the American physicians, and the negative results of their European brethren. The researches were made almost exclusively among children, as it is among these only, when young, that auscultation yields any practical indications; for beyond a certain age, or beyond a certain period of early childhood, the most practised ear applied to the cranium cannot detect morbid cephalic bruits. This period is that of the closure of the fontanelle. M. Roger states that his conclusions are drawn from an examination of upwards of 300 children.

The ear discovers, when applied to the cranium, certain sounds, physiological and morbid. The former are those of respiration, vocal sounds, and sounds of deglutition, &c. These being excluded as extrinsic sounds, there remains the physiological or normal existence of the *cephalic souffle* to be noticed. On the value of this sound in health opinions differ, the American authorities declaring that this sound is always abnormal, while Dr. Hennig (who discussed the question in the 'Archiv für physiologische Heilkunde,' Stuttgart, 1856), believes it to be indicative of returning health. M. Roger records 41 observations collected with the view of clearing up this point. Among these the *souffle* was absent in the majority (32 in 41). Contrary, also, to the statements of Drs. Fisher and Whitney, the sound was heard in nine children who were perfectly healthy. M. Roger adds: "It is neither a sign of certain disease nor habitually present in health; we regard it rather as an unfavourable symptom, and even when met with in children apparently quite healthy, some latent or dangerous malady should be feared." The *cephalic souffle* was more particularly studied by M. Roger in three different morbid states—viz., 1st, diseases of the encephalon; 2nd, alterations of the blood; and 3rd, various other diseases. The following are the chief conclusions at which the author has arrived: "Never, either in meningitis or in meningo-cephalitis, before or after the closure of the fontanelles, whether simple or tubercular, have we been able to detect the *cephalic souffle*. . . . In chronic hydrocephalus, in seven cases, five times the abnormal bruit was absent, twice it was present." Whence we conclude that it cannot be regarded as a certain sign of effusion in the brain.

There is no disease in which the *souffle* is more frequently present than in rickets, of which condition M. Roger regards it as, in a certain sense, pathognomonic. In every case where this bruit is heard, a common pathological condition, an alteration in the blood, is implied.

The seat of the *souffle* M. Roger believes to be in the large arterial vessels at the base of the brain, and that it depends upon inorganic causes modifying the density of the blood, or the proportion of its globules, &c. From all these observations, it appears that there is little clinical value attaching to auscultation of the brain, beyond its use in the differential diagnosis of hydrocephalus and rachitis. There is no cerebral affection which may be recognised by means of the *souffle*. Neither by its presence nor by its absence can any correct inferences as to the existence of any cerebral affection be drawn. Although from the researches of M. Roger we arrive at the indisputable conclusion that auscultation of the brain affords no reliable assistance in diagnosis of cerebral affections, yet we cannot but regard the labour bestowed by the author as well bestowed, inasmuch as it is a clear gain to know what would involve a waste of valuable time in its employment.

ART. V. — *On Glycerine, and its uses in Medicine, Surgery, and Pharmacy; being principally an Abstract of M. Demarquay's Treatise, 'De Glycériné,' &c.* By WILLIAM ABBOTTS SMITH, M.D., &c.—*London*, 1863. pp. 69.

THE contents of this little work well accords with its title, and we feel indebted to its author for having, in so few pages, brought together so much and such trustworthy information respecting a compound, which, though discovered in the last century by the illustrious Scheele, has only within a few years received the attention which it undoubtedly deserves. This discovery, indeed, may be adduced as a striking example of the fruitfulness of science in the application of its results to the useful purposes of life. Little could the Swedish chemist have imagined, when he first separated glycerine from oil by the action of lead, that he had brought to light a substance which, as shown by this treatise, is not only valuable to the medical practitioner, but, owing to its peculiar and very remarkable properties, may be of multifarious service in many of the arts, not excluding the fine arts. What is most deserving of notice in these properties is its neutral state, having, like water, neither a basic nor acid reaction, and like the same fluid, having a power of dissolving a great variety of substances without materially altering their qualities, with the additional advantage that it is not absorbent of oxygen. When we further add, that it is not volatile except at a high temperature, nor liable to freeze except at a very low one; that it absorbs water from the atmosphere, and is miscible with water to any extent, and is inflamed with difficulty, we have mentioned the properties belonging to it to which may be referred most of the uses to which it has hitherto been applied.

In reading Dr. Smith's very comprehensive account of glycerine, we have found little to comment on. It is clear and simple; and when he offers explanations of its action, these are commonly satisfactory. In one or two places, however, as it seems to us, he has fallen into error. Thus, when speaking of its physiological action when applied to the skin, he attributes "the peculiar and deeply-penetrating sensation of coolness which it produces, to its affinity for water," and "its condensing in consequence the watery vapour of the surrounding atmosphere." And further on, speaking of its application to the skin denuded of epidermis, when it occasions, it is said, a slight feeling of heat, he adopts the same hypothesis to account for the effect —viz., the affinity of glycerine for water, by "which it extracts moisture from the surface, and in this manner produces a temporary sensation of warmth." We need hardly remark that this latter explanation, which he adopts from M. Demarquay, is congruous with science, whilst the former, his own, and more than once given, is the reverse. If glycerine condenses, absorbs moisture—and we do not doubt that it does—it is obvious that a rise of temperature must result.

Amongst the many uses of glycerine already ascertained, there is one connected with the property just adverted to, deserving of being generally known—its protecting the skin from the effects of severe cold. The Russians, we are told, have found this out, and accordingly they anoint the face with it preparatory to setting out on a sledge-journey in winter. Owing to the same property, it may be inferred that a like application may be as serviceable in a tropical climate as a defence from the parching effects of heat, and even useful to the fireman in his most dangerous vocation amidst flames—glycerine, let it be kept in mind, being volatile at a high temperature, and yet with difficulty ignited so as to inflame.

Dr. Smith dwells on the propriety of using for medicinal, and indeed for all other purposes, the pure article, such as is obtained in the way of distillation by Mr. George Wilson's ingenious process. If impure, as he assures us it often is as sold in the shops, it can hardly escape discredit, be worse than useless, and even do harm.

The author has enhanced the value of the little treatise by inserting a variety of formulæ for the preparation of the most approved glycerolates (compounds or mixtures of which glycerine is capable of forming a part), such as have stood the test of experience in medical practice.

ART. VI.—*On Australasian Climates, and their Influence in the Prevention and Arrest of Pulmonary Consumption.* By S. DOUGAN BIRD, M.D., L.R.C.P.L., Physician to the Benevolent Asylum, Melbourne, and also to the Immigrant's Aid Society; late Staff-Surgeon in the Crimea; and formerly Resident Physician's-Assistant at the Hospital for Consumption, Brompton.

"SPEAK well of the bridge that carries you over." This, though not in words, is in fact the principle on which Dr. Dougan Bird has brought forward his views on Australasian climates; and he certainly has good ground for so doing when he tells us:

"Himself a *poitrinaire,* the writer has personal as well as professional experience of the effects of antipodal climates on consumption. More than three years ago two of the best stethoscopists in London pronounced his lungs tuberculous; to which opinion daily hæmoptysis, rapid loss of flesh, shortness of breath, and known hereditary predisposition, gave but too sure confirmation. A six months' rest from business, occupied in amusing travel, with careful treatment in the meantime, failed to do more than check the more urgent symptoms; and therefore a total change by a voyage to Australia was recommended, and at once undertaken. In less than three months from his landing in this colony the patient gained sixteen pounds in weight, lost all his symptoms, and remains at the present time in excellent health." p. 6.

At the same time, Dr. Bird guards himself from personal professional responsibility by admitting that he has himself practised only two years in Australia, and that he has submitted his views to others of his profession, whose much longer residence in the colony has given them greater opportunities for observation, and rendered their opinion more valuable.

It is not without certain deductions that evidence as to climate can be taken from parties living on the spot or interested in it; there is a tendency to beat the drum about this place or that by those who live or practise there, which when dexterously done often succeeds in investing the locality with a character that answers for a time exceedingly well.

It is very convenient for a physician to carry his *clientèle* with him to the sunny shores of the Mediterranean for five or six months in each year; it answers, no doubt, for both parties—certainly to one.

This is one way in which we may account for the rise and fall of various places in reputation for health-giving and life-prolonging; but unless barometer and thermometer, rain-gauge, hygrometer, and anemometer all concur to prove a satisfactory average in any given locality, mere statements of remarkable cures will not satisfy a critic in such matters; and even these require to be tested for a considerable period before they can be safely relied upon.

And then, what disappointments occur—how we have been roasted, chilled, dusted, and nipped at Montpellier; with what anxiety have we looked out for sound windows and well-fitting doors in Rome; while at Valencia last year a fireplace was a real luxury, and being the lucky possessor of one was held to be a warrant for asking an introduction to its strange but courteous owner for the loan of a warm at his blazing logs.

Of all climates visited by health-seekers, Egypt perhaps varies less year by year than any other; and yet this very winter ice was plentiful at Cairo, and the waters in the Delta were frozen.

"Of every hundred deaths in the British islands, 20 are caused directly by tubercular consumption; at least six or eight more victims to the same disease leave their homes to die at Nice, Pau, Madeira, or Algiers." (p. 3.)

Such is Dr. Bird's statement; yet this is not the fault of any one of these places in particular. The same patients would probably have died at Sydney or Victoria, at Cairo, Rome, or Palermo. They died where they died, but it is not saying too much to assert that many of these would not have died, had they betaken themselves to these very spots early enough.

Fashion has a great share, too, in creating a run on certain localities. We say emphatically, that for true pulmonary phthisis Rome is anything but a good winter residence; yet Rome is always full, sometimes —as this season—choked with visitors, nominally there for health.

The ordinary course of proceeding is too well known to need quoting; and thus often, far too often, the place advised as a winter residence is rather the result of what is thought likely to be agreeable, than what will be useful.

The recommendation of Australia will be adopted only on its intrinsic merits. It will be a long time before a sixty or seventy days' voyage will become fashionable, and we may examine its claims free from all imputation of yielding to a cry in its favour.

It is not requisite here to follow Dr. Bird into his disquisition on the rational treatment of tuberculous diseases. He has adopted views which are natural enough to one whose experiences are mainly drawn from his former position as house-physician at Brompton Hospital, as yet but little modified by general practice. We are quite sure that, had he seen as much of consumption out of an hospital as he has in, he would hardly have so overstated the modern treatment as he has done in the following lines:

"First, and most important (without which all treatment applied to the particular local manifestation of the disorder, wherever it may be, is but loss of time,) is *reversal of those circumstances, conditions, or habits of life under which the disease made its appearance, and* (especially if no such indication as an obvious cause presents itself), *the immediate institution of such an hygiene and regimen as we know from physiology and experience to be best suited to the preservation of health in a person already well.*" (p. 5.)

Our author would, had his practice lain *extra muros*, know how severely this fell disease visits those whose whole life is in accordance with the best hygiene, and how inexorably the pale Death beats at the doors of those who live so as not to die; but Dr. Bird has somewhat disarmed criticism in his preface, and we agree with him in believing that minuter details and finer touches will doubtless in future years be filled in by abler hands.

We accept also, in the fullest sense, this declaration of his:

"Again, let me impress upon my reader the importance of the proposition, that to make a change of climate simply a question of winter residence and avoidance of cold air, as is practically the common custom, is to limit ourselves to but one item of its capabilities as a remedy, and this not by any means the most important, in the treatment of the *early* stages of consumption." (p. 23.)

We will now follow him to his climate, and quote his *resumé* of Australian weather. After giving a table of comparative temperatures of twenty different places, including all those mostly resorted to by invalids, he says:

"Looking upon the question of temperature from these data of yearly and seasonal means, the great superiority of the Victorian climate to those of

Southern Europe is evident at a glance; but such figures do not give a sufficiently close view of the medical aspects of the question. Although the average summer heat is moderate in the neighbourhood of Melbourne, being only 4° higher than that of London, occasional extremes of heat occur under the influence of 'the hot winds,' of which we will say more presently, when the thermometer rises even so high as 100°, 105°, or 111° in the shade.

"Such a temperature occurs usually in December or January, but is very exceptional, and lasts but a few hours at a time.

"The lowest temperature ever experienced is 32°, and this is very rare. The five day means for six years, from 1855 to 1860 inclusive, show that from the 20th to the 24th of July is the coldest period of the year, the thermometer indicating 44°. These observations were taken in the most exposed situation in the neighbourhood of Melbourne, so that they may be regarded as excessive. In a sheltered situation in the centre of the city, the greatest heat recorded in three years, 1860-1-2, during the day was 78° (the thermometer hanging in a shop entrance with a southern aspect), and the greatest cold 46°. This gives a mean annual range of 32° only between 8 A.M. and 8 P.M., which is far lower than any of the recorded observations in Southern Europe.

"Hoar frost and very thin films of ice are sometimes but rarely seen in the suburbs during June, July, and August, but they disappear an hour or two after sunrise. The 'oldest inhabitant' is reported to have once seen snow reach the ground at the sea level; but as such an occurrence has not been observed for the last twenty years, the authenticity of the report is rather doubtful.

"The *mean daily range* of temperature is in spring 19°, in summer 21°, in autumn 17°, in winter 14°. In summer very rapid changes of temperature are experienced near the coast in situations exposed to the south. The thermometer sometimes falls 20° to 3° in the course of half-an-hour!

"So much for temperature. As regards humidity, the mean dew point for the year is 47°, that of London being 44°, and in this respect the air sometimes undergoes rapid changes. On a change of wind to the north, in situations having that aspect, the amount of moisture in the air may be reduced as low as 13 to 15 per cent.

"The average annual rain-fall at Melbourne is 26 inches, being two inches more than that of London, but the manner in which this is distributed is very different. In London, and in the whole of the southern and western districts of Great Britain, rain falls on 170 or 180 days during the year. We are all familiar with the phenomena of gathering clouds, and steady equable rain for days, or even weeks, together in the home climate. But in Victoria, the average number of days on which rain falls is only 104, and the average number of hours of rain for the year is only 532; for it falls in this country with a violence almost tropical, and very seldom lasts more than a few hours at a time. Thus, in 1855, on the 29th of September, the amount of rain collected during two hours and a half, was 0·92 inches. On September 23rd, 1856, the same quantity fell in twenty minutes. In 1857, in February, the fall of rain from 7 P.M. to the same hour on the following day, amounted to 3·420 inches, which would suffice for the greater part of a whole winter in England. On the 19th of December, 1858, 1·623 inches fell during the afternoon; on June 8th, 1859, ·616 inches fell in a few hours; on December 9th, 1860, in twenty hours 2.586 inches; and in 1861, on January 31st, 2·370 inches during eleven hours. If the rain in duration and amount were equally distributed every year, it would then rain nearly one hour and a half each day, at the rate of 0·075 inches, or about one-sixth of the time that the same quantity takes to fall in England. A continuance of overcast or cloudy weather is never observed in Victoria, the sky clearing as soon as the rain has fallen. Fog is of very rare occurrence. Mists hang about the Yarra occasionally in the early morning in autumn, but the sun is sure to eat them up at ten or eleven o'clock. The mean annual height of the barometer 120 feet above the sea is 29·900 inches, indicating rather a greater pressure of air than in most parts of Europe, but the yearly range is considerably less." (p. 37.)

We think that the Australasian climates have, by our author's own showing, many counteracting defects, and he has lightly touched upon these. We know these are by no means slight drawbacks; we know what the hot wind really is in its prostrating effects, as well as the irritating character of the north and north-easterly winds in winter, and it is hardly an argument to say, that the ill effects of these are less than those produced by a north-easter at Brighton, a mistral in Provence, or a tramontana at Rome. We are to look fairly at the advantages which we have a right to expect in compensation for the entire break-up of home and family, interests, ties, and occupations, and we confess we do not quite see that a case is made out.

Of course, statistics come in for their share of influence in his statements, and to this they are entitled, but it must be some time before they have more than an approximative value.

We will make one more quotation from his pages: "In 1861, the mean population of Victoria was 541,025, the deaths 10,522, or 19·45 per 1000, the births being 23,461. In 1862, the mean population was 549,958, and the deaths 9972, or 18·20 per 1000, the births being 23,618." (p. 48.) But Dr. Bird must not forget the influence an importation of lives, mostly between eighteen and thirty-two, must have on the death-rates; and again when he estimates the deaths in the penal establishments, he must bear in mind that not only have the convicts been subjected to healthy regimen, regular life, and examined before leaving the mother country, but that convicts in a feeble state of health, or not likely to live an average time, are not sent to the colony. Of course, against this he is entitled to set their previous life and habits, but this only makes the uncertainty greater. Add to this the rush of gold diggers from all parts of the world, and we have disturbing causes enough to make statistics as yet dubious:

"In the British Islands 40 per cent. of the annual mortality at all ages is caused by diseases affecting the respiratory organs—that is to say, pulmonary consumption, bronchitis, pneumonia, pleurisy, hydrothorax, asthma, quinsey, and laryngitis; but the same diseases on an average of six years, from 1854 to 1860, caused at Victoria only 15 per cent. of the total mortality." (p. 54.)

The main fact which bears on the value of Australasian (Victorian) climate, is that scrofulous diseases are notably less frequent and less severe. That this is to be accounted for by the effects of climate is, to a considerable extent, true; but it is more true that the altered circumstances and habits of the population at large will account for it, and there in turn Dr. Bird's reasons are greatly dependent on climates.

"In Australian towns an 'excavated room' (Anglice, a cellar) is unknown; pure air and sunlight abound for ten months in the year. In short, there is no mystery about the matter." (p. 64.)

We will not follow Dr. Bird into all the varieties of disease which are benefited by Australasian climates. From phthisis to sterility, from fever to broken bones, all do better there.

We have not space to pursue his account of the adaptation of the various localities and climates to different phases of disease, especially of consumption; we doubt whether Victorian climate, which in all respects may be regarded as the medium type of Australasian colonies, and (where seven per cent. of the mortality is from consumption) is the best. In many respects Tasmania has great superiorities; its mortality as far as it can be ascertained, is, for its towns, on a par with the combined town and country rates of England. At Hobart Town, the coldest winter has a mean of 45·82° Fahr. Count Strzelecki, a most competent authority, compares Launceston to Lisbon in winter, and to Cheltenham in summer.

The value of this really conscientious book may be thus summed up. Given a consumptive patient, whose home ties are easily severed, to whom a voyage of seventy days is not too serious a matter, and whose disease is not *too far advanced*, the chances of a prolonged life, and a comfortable one too, and even of complete recovery, appear to be greater than in Europe, better even than in Egypt, because there is a greater variety and selection both of summer and winter climate, perhaps even better than at the Cape of Good Hope.

Were we, like our author, phthisical, there is no doubt what we should do; for a dance over the waves has a charm for us that has led us from the North Cape to the Red Sea, but not even the first-class cabin, spacious and lofty though they be, of Messrs. Green or Wigram's ships can make a seventy-five days' voyage other than a very serious undertaking for an invalid, and were it not that in itself it is part of the recovering process, would be fatal to the success of Australasia as a rival to Ventnor or Torquay, Pau or Mentone. That many and many a young man or woman whose antecedents are unfavourable, who have lost parents or brothers from phthisis, will turn their eyes to this new Garden of Hygeia we doubt not; they cannot do better than so to shape their future course as to become colonial, to exchange for a life of great material comfort, prosperity, and health, one precisely the reverse.

To these, and such as these, this is a book of great use; from it they may gather much information and many useful hints; while to the physician who is large-minded enough to look beyond the fashionable rut and routine of practice, the perusal of this work will serve to enlarge his views and extend the resources at his command.

ART. VII.—*Agricultural Education.—London*, 1863. pp. 167.

THE little work which bears the above title consists of five introductory lectures delivered at the Agricultural College, Cirencester, by its Principal and several professors, on the occasion of the opening of its session. Inasmuch as these lectures are admirably adapted to show the scope in all its largeness of a good system of education of the student of agriculture, we are induced thus to notice the book, and in addition, for the same reason that on a former occasion we called the attention of our readers to Baron Liebig's work 'On the Natural Laws of Husbandry,' with the hope we then expressed of making it, through the members of our profession, better known to those to whom it is specially addressed.

Of the lectures now before us we may say generally that they will well repay any one's perusal, and especially as affording, 1st, just notions of the importance of agriculture in a national point of view—a prosperous agriculture being the best foundation for a nation's greatness, and an instructed and well-to-do agricultural class, including farm-labourers as well as farmers, the most reliable of the people in a nation's emergencies; 2ndly, as giving just ideas of the rational interests belonging to agriculture in connexion with the sciences, the study of which is essential to the most successful pursuit of it as an art.

ART. VIII.—*Insanity and Crime: a Medico-legal Commentary on the Case of George Victor Townley.* By the Editors of the 'Journal of Mental Science.'—*London*, 1864. pp. 47.

IN this pamphlet the wretched and sadly mismanaged case of Townley, the convicted murderer of Miss Goodwin, is well stated and well commented on by Drs. Robertson and Maudsley. The only satisfaction we can have in reflecting upon it is the amendment in consequence which the law on insanity is likely to undergo, with, if not a better definition of that mental disease on which irresponsibility for a criminal act can be pleaded (a strict definition may be objectionable), at least the enactment of a more rational and practical procedure than the present, for the conducting of cases in which the sanity of the accused is in question. The following quotations show strongly the necessity of some change, and are suggestive of its kind:

"A change in the existing method of obtaining scientific evidence," say the authors, "is plainly most necessary; nothing can exceed the awkwardness and uncertainty of the present plan of proceeding in England. 'An array of medical men,' as Dr. Bucknill observes, 'are marshalled by the attorneys on each side according to their preconceived opinions of the case. These medical witnesses may usually be divided into two classes—those who know something of the prisoner and nothing of insanity, and those who know something about insanity and nothing of the prisoner. They generally succeed in neutralizing each other's evidence and in bringing the medical profession into contempt, at least among lawyers.' Only by abolishing a system which puts a premium on unscrupulous advocacy—for it invites those who are more eager for notoriety than careful for truth—which practically excludes the tender conscience from giving scientific testimony in many cases, and which subjects medical science to extreme degradation, can the benefit of any change in the present law be reaped. Scandal must occur as heretofore, if no steps are taken to secure impartial scientific evidence." (p. 46.)

"The remedy," they say, "is an obvious one; it is to make the medical witnesses in matters of science witnesses not for the prosecution or the defence, but witnesses called by the court itself. Then would their evidence be freed from all suspicion of advocacy, and gain the authority which is now wanting. In France, when a criminal is suspected to be insane, the court appoints a commission of medical men, or selects one man experienced in mental diseases, to examine into the case and to report upon it; the whole life of the prisoner and the present symptoms are investigated, and the questions put and the answers to them are recorded for the information of the court. Such an alteration," they well observe, "would not be any novelty in England; for in difficult questions of collisions on the sea and of salvage, where special knowledge is required, the Masters of the Trinity Company are called to assist the Admiralty Court. And surely a shipwreck or a collision at sea is a fact much more within the knowledge of ordinary men than the diagnosis of cerebral disease where lunacy exists."

We must not end our brief notice of this pamphlet without recommending it strongly for careful perusal to men of our profession and to the gentlemen of the bar: both may profit by it.

Art. IX.—*Notes on the Climate of the Swiss Alps, and on some of their Health Resorts and Spas.* By Hermann Weber, M.D., F.R.C.P., &c.—*Dublin*, 1864. pp. 30.

We might find fault with the title of this pamphlet, inasmuch as it is rather a sketch of the climate of the Alps and its influences than notes, if by the latter word is implied, as we would use it, original observations by the author himself. However, if this be a fault, it is a venial one, and no other can we find. The few pages which comprise it are full of valuable information on a very interesting subject drawn from the best authorities, and with this advantage, that Dr. Weber, as it appears, is well acquainted with the Alpine regions of which he treats, and is in other respects highly qualified to criticize and appreciate justly the observations of others.

His sketch is very comprehensive, including the meteorology of the Alps and their physiological, pathological, and therapeutical influences. The following is the author's summary of the principal points discussed, or rather inferences drawn. We trust that the importance of the subject and its increasing interest may warrant the length of the quotation:

"1. The *temperature* is lower; it decreases in proportion to the increasing elevation at the average rate of 1° Centigrade (1·8° F.) for every 544 feet. The annual monthly variations are less great on elevated places than in plains.

"2. The *atmospheric pressure* decreases, or the air becomes thinner with the increasing height.

"3. The *absolute amount of humidity* in the air becomes probably less with the increasing elevation, but the *relative amount*, or the degree of saturation, is, in general, greater in the lower mountainous regions—viz., from about 1500 to about 4000 or 5000 feet high—than in the plains; whilst in the highest regions—viz., above 6000 and 7000 feet—the absolute and relative degrees of humidity are diminished.

"4. The *rapidity of evaporation* is increased in the higher mountainous regions.

"5. The *motion in the atmosphere* is considerably greater in the mountains than in the plains. There are, however, great variations depending on local circumstances, in addition to the peculiarities more or less common to the whole district of the Swiss Alps ('mountain' and 'valley currents;' 'Föhn').

"6. There are more thunderstorms in the lower mountainous regions of Switzerland than in the higher regions or in the plains. There is a greater amount of positive electricity in the air on the tops of mountains than in lower regions.

"7. The air of the higher regions of Switzerland is free from marsh malaria; the amount of ozone is probably greater in mountains than in valleys and plains.

"8. The sky is, in the sub-Alpine regions, more frequently dull by mist and clouds than either in the plains or higher Alpine regions.

"9. The degree of insolation or exposure to the rays of the sun is greater on elevated situations.

Concerning *the physiological influence* of the mountainous climates on the visitor, we may assume:—

"10. That the respiratory movements become increased in frequency and depth with increasing elevation, there being no exact experience with regard to the amount of oxygen inhaled and carbonic acid and water exhaled.

"11. The contractions of the heart become more frequent in proportion to the elevation.

"12. The appetite becomes increased; the thirst is likewise, in general, augmented.

"13. The sanguification is improved.

"14. The nervous system becomes invigorated; the sleep, in general, more healthy.

"15. The activity and energy of the muscular system become increased.

"16. The secretion of the skin is most likely augmented.

"17. The urine appears to be not materially altered in quantity, the amount of solids being probably slightly increased.

"18. The metamorphosis of tissues is, we may infer, accelerated.

"With regard to the *pathological character* of the Swiss Alpine climate, it has been shown that—

"19. The prevalent diseases are the inflammatory affections of the respiratory organs, and their results, chronic catarrh, emphysema, and asthma; goître and cretinism, and scrofulous complaints; rheumatic affections and diseases of the heart; which affections are in some degree due to the unfavourable hygienic conditions in which most of the inhabitants of the Swiss mountains live, while others are dependent upon the meteorological peculiarities of the climate, and especially the unfavourable influences prevalent during the cold season.

"20. It has further been shown that, in the true Alpine regions, tubercular consumption is extremely rare, as also cretinism; and that, on the whole, with the increasing elevation, the following affections become much less frequent—ague, acute diseases of the liver, hæmorrhoïds, diarrhœa, and dysentery, yellow fever, and cholera.

"21. The *beneficial influence* of the mountain climate is especially felt in various forms of dyspepsia and dyspeptic hypochondriasis, in the atonic diarrhœa, anæmia, and want of tone observed in people returning from hot climates; in the cachexia, with or without splenic tumour, caused by marsh malaria; in the various forms of anæmia, chlorosis, and hydræmia, not dependent upon serious organic disease: in scrofulous complaints; in the tendency to tuberculosis, and in its first stage, especially in the higher regions, while in the slightly advanced forms some of the lower and more sheltered situations only ought to be resorted to; in chronic bronchial catarrh, with abundant secretion. Sleeplessness, hysterical and neuralgic affections, as also hypochondriasis, are often removed by a stay on the Alps."

These conclusions we are disposed to consider as approximations rather than as established facts—at least for the most part—to be confirmed or modified by further research, especially those of a physiological and pathological kind. This, however, is certain, that in every part of the world a mountainous region, according to its varied physical circumstances, exercises a peculiar influence on the health and character of man—an influence which varies in degree, and somewhat in kind, according to the altitude. Even in our own country we have proof of this. Who that has passed a summer and autumn in the Highlands of Scotland has not been fully sensible of its invigorating climate? And who—but these are few—who have resided for any time in our Lake District, or in Wales, at elevations reaching to near one thousand feet above the sea-level, that have not benefited in point of health by such a residence? We have little doubt that the time will come when such abodes will be more sought after by the wealthy, whose means may enable them to meet the increased expenses of such a residence.

Incidentally, Dr. Weber makes some remarks which we could wish to transfer to our pages. His account of the different condition of the men and women of the canton of Appenzell, is one of these. He gives it when adverting to the influence which the manner of living exercises on the development of scrofula and consumption. In that canton, he remarks:

"Most of the men are strong and healthy-looking; scrofula and consumption are rare amongst them. Most of the women, on the contrary, are weakly, pale, and ill-developed; amongst them consumption and scrofula are of very frequent occurrence. The occupation of the men consists in tending their flocks, in hay-making, and other outdoor work; their food is milk, cheese, bread, and sometimes meat. The employment of the poor women consists in making the well-known embroidery; their food consists principally of potatoes, cheese, and bread. Most depressing is a visit to the workrooms of these poor creatures; there they sit crowded together, summer and winter, in small, ill-ventilated rooms, in a stooping position, some of them even before reaching the twelfth year of age."

Would that there were no parallel to this in our own land! We have just been reading the admirable biography of a hero-man—the late Sir William Napier. Speaking of what he witnessed in a visit to a great cotton-manufactory in Manchester, he says:

"The noise of the machinery was deafening, the heat intolerable, the smell disgusting, and the haggard faces, distressed forms, and miserable looks of the women and children employed were heart-sickening. None of the children, and very few of the women, dared to look at us as we passed through the room. Misery of mind and body, pain, and fear, and hopelessness, were in every countenance. It is a hellish system, and cannot lead to ultimate good. And yet one gentleman who was with us, having a wife and a half dozen children of his own about him, on my remarking on the diseased looks of the children, told me, with the quiet conviction of its truth, that tables had been made out which proved these squalid creatures to be more healthy than any other class of working people! 'No doubt!' as I said to him at the time 'no doubt! the tables prove it—they were made to do so.'"

This was 1838. The language is strong, after the manner of the man, but we fear that at the above date it was without exaggeration. The cotton famine, a visitation hardly got over, is, we cannot but think, a proof in part of the evil in principle of the gigantic manufactory system; and the circumstance of which we are assured, that since so many of the manufactories have been closed, though the workpeople have fared but poorly, dependent on charity, there has been a decrease of mortality, seems strongly corroborative, and a proof that such in-door, monotonous work, is anything but wholesome or for the advantage of either body or mind.

ART. X.—*Anatomy Descriptive and Surgical.* By H. GRAY, F.R.S., F.R.C.P., and Lecturer on Anatomy at St. George's Hospital Medical School. The drawings by H. V. CARTER, M.D., late Demonstrator of Anatomy at St. George's Hospital, &c. Third edition. By T. HOLMES, M.A. Cantab., Assistant-Surgeon and Lecturer on Anatomy at St. George's Hospital.—*London,* 1864. pp. 788.

WHEN the first edition of this work appeared in 1858 we felt bound by its intrinsic excellence to recommend it most highly to the attention of the student. Mr. Gray was most happy in obtaining the cooperation of Mr. Carter (now Dr Carter and Professor at Bombay) in carrying out the plan of his work; indeed, without the excellent illustrations from the pencil of that gentleman the prospects of its complete success would in our judgment have been at least doubtful. Moreover, Mr. Gray was materially assisted in the dissections carried out for the original drawings, from which the engravings were executed, by Mr. Carter, then Demonstrator of Anatomy at St. George's Hospital. Since the early and lamented death of Mr. Gray, to whose anatomical knowledge and untiring perseverance the school of St. George's willingly owns itself so much indebted, the preparation of a future edition was wisely entrusted to Mr. Holmes, whose duties, as he informs us in his preface, have been "restricted to an attempt to give greater precision to the language, and to supply the necessary references to anatomical works of merit which had been published since the date of the last edition." May this practical and valuable work, which does so much credit to the St. George's Hospital school, run through many more editions under the same auspicious guidance!

ART. XI.—*Die Irrenheilanstalt in ihren administrativen, technischen und therapeutischen Beziehungen.* Von Dr. G. SEIFERT. Nebst den Plänen einer Heilanstalt für 200 Kranke.—*Leipzig*, 1862. pp. 97.

Asylums for the Insane, considered with reference to their Management, and as places for Treatment, &c. By Dr. G. SEIFERT. Illustrated by a Plan for 500 Patients.

MUCH attention has of late years been given in Germany to the subject of asylum-construction and management; and several brief treatises upon it have recently made their appearance, of which the one under notice—a prize essay—is perhaps the most complete. It is divided into three parts, the first of which is occupied with the examination of the general questions of the site to be selected; state supervision; the direction or superintendence, and the subordinate staff necessary. On the matter of superintendence the author enunciates the sound doctrine that a physician is the only proper director, and that the entire control of the institution and of its servants should be lodged in his hands. He objects to the interference of committees in the internal management, considers the liberty of the English superintendents to be improperly curtailed by the Commissioners in Lunacy, and quotes the remark of Dr. Dick, contained in his notes on English asylums, that their "physicians are under restraint, their insane inmates not."

The author also rightly animadverts on the small medical staff employed in English asylums, and on the complete inability of their superintendents to discharge the duties rightly devolving upon them. His estimate of the medical staff required in an asylum for 200 insane, which agrees with that of his countrymen at large, is for a medical superintendent or chief physician, an assistant physician, a medical subordinate, duly qualified, and lastly, an advanced student, who is practically studying the treatment of the insane, but receives a certain remuneration for his services, with board and lodging. The attendants required, as set forth, are two head male, and two head female attendants, with twenty subordinates in each of the two sections of the asylum. We commend these views to the worthy visiting magistrates of some of our English asylums, and humbly suggest their perusal of this and several other foreign essays, in which their pet principles or notions of asylum management are irreverently discussed and rejected.

The second part of the work is occupied with an examination of the principles of distribution of sections and of those of their construction, of the plans available for lighting, ventilating, and warming asylums, &c. The third portion is devoted to the consideration of the various matters connected with the internal economy of an asylum; the occupation and amusement of patients, their food, clothing, &c., and with the duties of attendants and servants.

In treating of these various subjects, the author exhibits generally very enlightened and correct views of the character and wants of the insane, and shows a fair acquaintance with the writings of others on the topics he considers. Unluckily, the poverty of English medical literature in works on asylum construction and management leaves him no other treatise than that of Dr. Conolly, published nearly twenty years ago, to appeal to for English opinion and practice; and it is therefore not astonishing he should here and there exhibit a very indifferent notion of the views and principles entertained in England at the present day. Like most physicians of foreign asylums, he also must hurl his dart at the blind obstinacy of the English, in advocating non-restraint in the treatment of lunatics; but, as usual, it is a missile not calculated to pierce through that obstinacy, for it is pointed by only some well worn-out objections, and is, moreover, aimed by an individual who has no personal acquaintance with the system of non-restraint, as understood and practised in this country. This little tirade against English non-restraint is a trivial blemish, and does not detract from the general merit of the book in respect to the subjects it treats upon.

ART. XII.—1. *Fluctuations in the Death-rate, with a glance at the Causes.* By Dr. NOBLE.—*Manchester*, 1863.

2. *Remarks on some of the Numerical Tests of the Health of Towns.* By A. RANSOME, M.B., B.A. Cantab., and WILLIAM ROYSTON.—*Manchester*, 1863.

3. *Variation in the Death-rate in England.* By WILLIAM ROYSTON.—*Manchester*, 1863.

COULD we feel sure that the majority of those who will look into these pages, like Mr. Cobden, never read the 'Times,' we should save ourselves the trouble of a criticism, reproduce the admirable article to be there found, and present to our readers a far abler review of this interesting paper than we can possibly offer. Mr. Cobden, of course, has not read the 'Times' article, but we hope he has read Dr. Noble's paper, and taken it to heart: there is a sentence in it quite as true of political as of statistical generalizations, and which will do every man good to bear in his mind when he is summing up.

Dr. Noble deprecates

"the disposition very generally manifested to attribute every accidental elevation or depression in the death-rate, occurring in any part of these districts of the cotton manufacture, to the distress which the diminished supplies of raw material have caused to fall upon many of our working population."

The value of Dr. Noble's paper may be measured by the rashness with which men whose hearts are earnest for the amelioration of the working classes jump to conclusions as to the causes and extent of their degradation and distress.

We have heard men round whose hearts cotton had never spun a deadening coil, blunder into statements which no doubt appeared to them true, and who were very wroth at finding their special solution of an existing difficulty in a general, not in a peculiar cause. A sweeping generalization is quite as often a flight of imagination as the product of reflection. While in the cotton districts the rate of mortality was said to be influenced by the supply (or want of it) of raw material, there were other parts of our manufacturing world, not using cotton as a staple, who felt the derangement of trade collaterally very severely, and yet without affecting their death-rates.

In the East of England, where the poor-rates have reached an amount never dreamed of in Manchester and Blackburn, the mortality ruled low. Then came large orders for American armies, and contemporaneously with them small-pox, scarlet fever, and typhus prevailed; the consequence was a high death-rate. At the time Dr. Noble's pamphlet appeared, the poor and borough-rates of the district alluded to were five shillings in the pound on the rack-rental; and such is, in fact, the chronic condition of the rate in this district. Dr. Noble shows plainly enough that the causes of a fluctuating death-rate must be sought in a number of co-operating causes—that you may have a short supply of cotton and an abundant supply of measles, or plenty of cotton and plenty of typhus likewise. Influenza will carry off the old and young with the bank-rate at 3 per cent., while a tight money-market and a healthy season may coincide.

It is when prevalence of epidemics acting with long-continued depression in wages, and an extended period of reduced nutrition, that these combining raise the death-rates; but there are other and directly opposite causes which will produce the same effects.

We have more than once seen a sudden influx of work and rise of wages call a rapid immigration of hands into a district where the accommodation, water supply, and drainage, were inadequate for the increase. We have seen an otherwise healthy district become eminently unhealthy, and fevers have been generated as certainly as the shoes have been made.

The Registrar-General's return for 1863 shows a very high rate of mortality for that year, and yet it was not a period remarkable for any general visitation of sickness and distress. The influence, too, of this same year on life assurance societies has been very marked, and will be felt in its effects on future bonus declarations. In one large office with which we are acquainted, the deaths for 1862–63 were very little below those of the cholera years.

In his penultimate paragraph Dr. Noble has put the whole matter in its true light, and exposed the evils of hasty conclusions.

"After all, shall we not look for the origin of many of these speculations to a certain infirmity of our nature, which shrinking from the labour of thoughtful investigation, is ever impatient to at once assign causes? 'The mind,' says Lord Bacon, 'has this property, that it readily supposes a greater ordered conformity in things than it finds;' and thus when a local calamity is seen to have been associated even for a few months with a rise or a fall in the corresponding mortality, a causal nexus is at once anticipated; and anticipations, says the great authority just quoted, 'have a much greater power to entrap the assent than interpretations.'"

That the clear-headed, close-searching men of Manchester, should be very earnest to arrive at an accurate apprehension of the extent and causes of mortality in dense populations will be at once understood by the consideration of the frequent statement of Mr. Royston, who while remarking on the influence of immigration from town to country upon the death-rate says:

"In Liverpool, it is calculated that this cause (immigration) makes a difference of 6 deaths per 1000 per annum. To show the effect of this immigration it may not be out of place to state that, without it, Liverpool would soon decrease. In the five years ending 1858, the deaths exceeded the births by 55. But the mere decrease of the population would be the least important feature; it would so alter the character and proportions of the population, as regards its age, that in a few years there would not be a sufficient number of adults to carry on the business of the town."

No doubt the influence of occupations on health is very great, but there are few or no cotton-mills in Liverpool, and the excessive mortality must be sought for in other causes, and probably the most potent is that of density of population. There is hardly a single position taken up by statisticians, with regard to the death-rate, that does not require some modification when applied to different and differing localities, or when these are brought into comparison one with another; but the position which is the most constant, and most to be relied on, is that of the effects of density of population.

When, therefore, the Registrar-General states the rule, that the rate of mortality increases with the density of population, he lays down a law which holds good in thirteen out of the fourteen of the divisions of the Registrar's districts.

But even with this must be coupled other circumstances to be considered, not only the numbers but the quality of those thus congregated together. We believe that no such an amount of mortality would take place from a similar crowding of cleanly, well-washing, well-ventilated folks, people who live cleanly in all the senses of the term. It is because the habits of those who are thus driven together, by the compulsion of society, are so filthy, because all laws of decency are disregarded, because of the intemperance and vice, that go hand in hand, striking down the parent, and tainting the offspring, that the death-rates are thus augmented in populous places.

It is well known and admitted that the chief cause of excessive mortality in large towns is in the deaths of children under five years of age. Thus at Liverpool they are 17, and at Glendale, in Northumberland, only 4 per mille.

There are many differences of opinion as to the best method of computation; they are all defective in some way, and when required for close investigation and nice comparison, several sources of error must be eliminated.

It is not enough, for instance, except for rough purposes, to take the national system of reckoning adopted by the Registrar-General, for the disturbing element will be found in the migratory character of a large part of the population of the great manufacturing centres before alluded to. Still more faulty is what is termed the $\frac{\text{death}}{\text{birth}}$ method of Dr. Whitehead, by which the number of deaths for every hundred births is held to be the death-rate, and the gauge of the healthfulness of any given spot.

There are so many and various causes influencing the births in certain localities—dull trade, large tracts of land in the hands of one proprietor, the emigration to more thriving districts, may all give a very healthy spot a very bad character for salubrity. These act either by preventing marriages or by removing people of the reproductive age.

Close by a large manufacturing town of our acquaintance is a small village of only 120 inhabitants, whose births are below its deaths, and yet one of the inhabitants is in his 101st year; and there died within the memory of the writer a woman at 103, and an old lady either ninety-eight or ninety-nine, the granddaughter of the Duke of Monmouth.

Per contra, a rapid increase of births would lower the death-rate in appearance, though the place might be ill-drained, crowded, and unhealthy.

When we come to investigate the causes of death, we are over apt to assume that these are exclusively dependent on want of proper sanitary arrangements, and in like manner those who have adopted these conclusions are disappointed when they see a high mortality maintained in spite of heavy outlays for drainage rates, water supplies, and similar arrangements.

These are indeed the foundations of improved public health, without which all other efforts will fail to effect amendment; but they are not all; and the want of proper self-management and defective knowledge of promotion of health among the people themselves, is a most potent cause of failure.

It is not easy, certainly—perhaps hardly possible—to get at the secret history of all the diseases which figure in the tables of the Registrar-General; and yet to patient investigators like Mr. Ransome and Mr. Royston, they do give up the secret of their fatal workings.

The conclusions given by these gentlemen at the end of their modest and useful contribution to sanitary science, show how much care and deliberation is required, and how many causes of aberration exist, in any one system of computation:

"1. That the migration of persons from healthy districts into large towns alters materially the proportions of the inhabitants at the several periods of life, and causes an important variation in the death-rate.

"2. That this variation, not being due to causes connected with disease, prevents any determination of the health of towns by a mere comparison of their respective death-rates.

"3. That, to obtain a typical representation of the mortality occurring amongst the fixed population of large towns, the deaths at those ages most affected by the fluctuation of the population must be separated from those which take place at an earlier period of life.

"4. That the proportion which the number of births bears to the number of deaths happening in any community, is no test of the healthiness of that place.

"5. The average age at death, in any town, is not a fair test of its salubrity.

"6. The preventible deaths are not alone caused by defective sanitary conditions, but frequently also by want of knowledge and want of care on the part of the inhabitants.

"7. That no conclusion, therefore, can be drawn respecting the sanitary condition of a town from a mere inspection of the rate of mortality.

"8. That the instruction of the public, and especially of the poor, in matters relating to health, is as important as the prosecution of sanitary reform by legislative and mechanical means."

Art. XIII.—*A System of Instruction in Qualitative Chemical Analysis.* By Dr. C. R. Fresenius. Sixth Edition. Edited by J. Lloyd Bullock.—*London*, 1864.

This standard work maintains its high character. The new edition differs from that of 1859 not only by reason of the numerous alterations and improvements which have been effected in the text, but also by the insertion of several additional chapters, which considerably augment the value of the volume. These additions, occupying about fifty pages, refer to the use of the spectroscope in analysis, a coloured plate of several characteristic spectra being given; to the employment of Mr. Graham's method of dialysis; and to the detection of the element phosphorus and other poisons in medico-legal researches, the special apparatus required for these purposes being figured. The part of the work which treats of the detection and isolation of poisons when occurring mixed with much organic matter, will serve as a faithful guide to all engaged in toxicological inquiries, which are often of such serious moment.

We trust that the author and editor of this work will be able ultimately to simplify its complex and puzzling system of cross references which the absence of tables has introduced.

Art. XIV.—*The Quarterly Journal of Science.* No. II. April, 1864.

In the last number of our Review we made favourable mention of this new journal. Its second number, that for April, justifies our expectations. We are glad to see that physiology and anthropology are not neglected in it, of which proof is afforded in some valuable articles contributed, one by Dr. Carpenter on the Correlation of Physical and Vital Forces, begun in the first and finished in the second number; others by Professor King and Dr. William Turner on the reputed fossil man of Neanderthal, and on the controversy which the Neanderthal skulls have given rise to.

It may interest some of our readers to know that the 'New Edinburgh Philosophical Journal' is merged in the 'Journal of Science,' and that one of its able editors, Professor Balfour, is pledged to give his support to the latter.

PART THIRD.

Original Communications.

Art. I.

A Summary of some Experiments to Compare the Value of Ventilation by Pumping and Ventilation by Rarefaction. By M. Berkeley Hill, F.R.C.S., &c.

Rarefaction of the air to be removed, and its consequent displacement by cooler fresh air, is the means of renewal employed in most systems of ventilation; some plans, however, use mechanical impulsion of the fresh air, or withdrawal of the vitiated air, as an addition, or even as a substitute to rarefaction. Hence, the various methods of ventilation may be divided into three classes.

First, those which obtain renewal of the atmosphere by a continuous current of fresh air flowing in to replace the vitiated air, which, in consequence of its increase of temperature and rarity, escapes by ascending through apertures provided for that purpose.

Second, those which aid or replace the current resulting from rarefaction by one produced by machinery.

Third, those which procure the necessary renewal of the atmosphere by permitting external currents of air to flow freely through the apartment.

Difficulties of various kinds beset the working of all these methods; one common to them all is the great one of producing a sufficient supply of fresh air without creating violent draughts. Insufficiency of the supply of fresh air is the most frequent cause of failure of the two first series of plans, while the necessity for suspending the operation of the last series during bad weather renders any plan which depends on that alone imperfect and unsatisfactory.

To ascertain the value of any method of ventilation, exact and careful observations of the work it actually performs are necessary, besides estimate of the general results obtained, because it is impossible to distinguish how far these latter are dependent for success on mere ventilation, and how far on other agencies; but unfortunately, exact observations of this kind have been made on very few systems of ventilation, for which reason I trust those to which I am going to refer will prove the more interesting and worthy of narration. Their results, moreover, are in some respects very different from the opinions commonly received, which are often based on uncertain foundations.

The efficiency of any plan of ventilation will be, perhaps, more readily appreciated if the requirements of good ventilation are first enumerated.

Andral and Gavarret estimate the quantity of air expired from the lungs of a healthy man to be $11\frac{1}{4}$ cubic feet per hour, of this 0·686 (two-thirds) of a cubic foot is carbonic acid gas, being a proportion of from 3 to 5 per cent. of the expired air. In the same time, about 600 grains of aqueous vapour have escaped from the lungs and skin of the man, which vapour half saturates 212 cubic feet of air at 60° Fahr., under the ordinary barometric pressure.

Half or three-quarters of the maximum saturation is, in this climate, the ordinary condition of the atmosphere, and that most agreeable to respiration. By this dilution—i.e., to 212 cubic feet—the carbonic acid also is rendered innocuous, for it has not been shown that a proportion of less than half of 1 per cent. exerts an injurious effect on those respiring it. Peclet suggests that, in absence of more exact data, the proportion of fresh air which will reduce the vitiated air to the ordinary condition of saturation should be taken as the minimum quantity necessary to be furnished to an apartment. But this quantity, though it may be theoretically sufficient, is not found in practice to meet the demand, and consequently, as our knowledge has advanced, the ration of air has been much increased, both by enlarging the allotment of space, and by replenishing it more frequently. The minimum size of the apartment, consistent with health, may be considered to be that in which a sufficient supply of air can be circulated without subjecting the occupants to violent draughts.

But where continuous ventilation is absent, as in ordinary bedrooms, which when in use have no, or almost no ventilation, the minimum space allotted to each occupant, reckoning him to stay eight hours, and consume only 200 cubic feet per hour, is 1600 cubic feet. There can be, I think, little doubt that even this amount of space would not suffice for a healthy sleeping apartment, if all ventilation during the hours of rest be suspended. Of course, a much less space can be maintained in a wholesome condition by a continual circulation of air. Again, the size of an apartment is, to a certain extent, determined by its use. A theatre, or concert-room, may be packed much more closely without injury to the occupants than an hospital ward; those of the first being healthy, and making in it a short stay, while those of the second are permanent occupiers, and are disseminating morbific matters, which must be quickly removed lest they propagate fresh disease. Reveil found in the wards of an hospital containing cases of scarlet fever and purulent ophthalmia, the sporules of tricophyton tonsurans—or at least organic bodies resembling them—floating in the atmosphere, and epithelial debris was detected by the microscope in the dirt of the walls and ceilings of the St. Louis Hospital, at Paris.

All hospitals of recent construction in England have a much larger space allotted per patient than their predecessors, from 1500 to 1800 cubic feet being now the average quantity; and the newest of all have the greatest space. The Parisian hospitals afford, one with another, 1500 cubic feet per bed; but the new ones contain 1900 to 2300 cubic feet. Hence the French authorities are more alive to the necessity for ample space than the English ones.

The quantity of air which experience has found requisite to preserve an atmosphere free from odour and of pleasant quality, which are at present the only reliable tests we have of the wholesome condition of an atmosphere, is generally about 2000 cubic feet per hour for each individual. This quantity was stated by the late Sir Joshua Jebb to be the amount supplied to the cells of Pentonville and Dartmoor prisons. A like quantity is furnished to the cells of the Mazas prison at Paris. In the report of a commission appointed by the French Government to investigate the subject, and decide which were the most suitable plans for ventilating the new Palais de Justice and the new theatres on the Place du Châtelet, at Paris, 2000 cubic feet is given as the amount of circulation advisable for the ventilation of buildings. To hospitals, however, the commission assigns 3000 cubic feet.

We may therefore assume—that adequate ventilation of space occupied by persons in health is supplying 2000 cubic feet per head of air saturated with aqueous vapour, from one-half to three-quarters of the maximum, not containing more than half of 1 per cent. of carbonic acid, and heated to a temperature of 60° Fahr., in such a manner that violent draughts are not created.

The external arrangement of the building is in all systems of ventilation a matter of considerable importance, as proper exposure to atmospheric currents is the only means of ensuring a pure source of air independent of advantages other than those immediately connected with ventilation.

Two of the modes of ventilation whose working illustrates the objects of this paper are erected at the Lariboisière Hospital at Paris, and were subjected to very careful examination by the French commission. It will probably assist the comprehension of the two methods if I give an outline of the arrangements of that institution. This building is also considered by French architects to be a model of hospital construction.

The part of the institution devoted to the in-patients is divided into six distinct houses. Each house is separated from its neighbours by open space on all sides, that no impediment to the external ventilation may exist. The houses or pavilions contain three wards a-piece—one ward, with its adjuncts, on each floor. The wards hold thirty-two beds, and their proportions allow a space of 1900 cubic feet per bed. Eight windows on each side admit fresh air and light. To this liberal provision for access of air to the building is added a complex system of ventilation for ensuring a regular supply of fresh air in its interior, independent of the variations of weather. These systems are not all alike, being constructed on two different principles by two different makers. The first examined is devised on the rarefication principle, and is known as Duvoir Leblanc's.

First Class.—By means of a heated exhaustion shaft, a continuous current of air is withdrawn from the upper parts of the wards. The air thus abstracted is replaced by fresh air, admitted at once from the outside of the building by flues running under the floor, and terminating in the middle of the room. This air is heated to a suitable temperature before it reaches the ward by being drawn over hot-water pipes and through hot-water stoves, whence it escapes into the middle of the room. By this arrangement a continuous current of warm air in winter, and of fresh air in summer, is directed through the wards with the following results, which were determined by repeated observations.

In the first place, the ward's temperature was sufficient, being about 60° Fahr., and the air thus heated had not acquired any unpleasant smell or dryness; next, the patients were unconscious of any disagreeable draught in any part of the room.

By experiment the air was found to be in motion throughout the ward, making a series of eddies or currents which pervaded every part. In the ordinary working of the ventilation—that is, with shut windows, for it was winter at the time the experiments were made, and the supply of air came mainly through the stoves—the amount of air coming in by this approach was about 2200 cubic feet per bed per hour. The amount abstracted from the wards being 2700 cubic feet, the difference was made up by air entering at the doorways; but if the windows were freely opened the amount extracted rose to 4000 cubic feet. Another point of importance, showing the necessity for contriving in all places of ventilation free access of air, was the discovery that the removal from the stoves of gratings and valves, which were acting as obstructions, greatly increased the supply of air, by as much as 1400 cubic feet per hour, through one of the stoves thus cleared. The exhaustive power sufficient to produce a considerable circulation of air if the passages through which it is conducted be tolerably direct, that friction may be reduced to a minimum. Hence multiplication of flues is always to be avoided as much as possible; no more should be contrived than will maintain a circulation of air throughout the apartment; and this circulation is much greater than is supposed whenever there exists a difference of temperature in various parts of the room. This fact was shown by the experiments made by the English Commission appointed in 1856 to inquire into the means for ventilating and warming dwellings. These experiments showed that in a room with an open fire or stove, if there were also an aperture for escape of the air from the room, wherever that might be placed, a series of currents were formed, some flowing towards, others from, the source of heat, so that no part of the air in the room remained in a stagnant condition. The French Commission having ascertained this (Duvoir's) system of ventilation to supply by day 2700 cubic feet per hour, made various examinations to ascertain the amount of circulation through the flues during the night, when the windows and doors are closed, and the fires slackened. At about two A.M. they found the average to be 1470 cubic feet of air passing through the stoves per bed per hour. This quantity, less perhaps than should be supplied during the hours when the ward is closed, must not be assumed as the maximum evacuation of the exhausting shaft at that hour, because it has always been shown that more air left the wards than entered them by the stoves and flues. Probably, therefore, with larger flues the amount would have been greater during the night.

The important features of this plan of Duvoir's are:

1. A good quality of the air supplied, which is ensured by taking it at once from the open air.

2. The supply is at least 2500 cubic feet per hour for each occupant, and the principle of construction will permit a much greater circulation without raising the cost, by simply enlarging the passages through which the air is drawn.

3. The circulation is steady, and not impeded, but assisted by freely opening windows and doors.

4. There is no difficulty in increasing the circulation at seasons when a more rapid ventilation is necessary.

5. The temperature is easily maintained, and evenly communicated throughout the ward.

The cost will be given later, compared with that of the other systems.

Second Class.—The next method of ventilation examined by the Commission is one which is employed to ventilate several of the pavilions of the Lariboisière Hospital. This method belongs to the second class; that is to say, it creates the circulation by pumping as well as by rarefaction. It is called the Système Farcot.

Its theory is—air pumped in sufficient quantity into a space will, by its pressure, drive out the air already there, which is vitiated, and ready for removal.

The apparatus to produce this consists of a pump worked by steam, placed in an air-chamber, from which it drives air through flues to the wards where the flues and stoves are placed along the middle of the room, similarly to those in the system of Duvoir. The air is heated by steam-pipes from the engine boiler, which run along the flues to the stoves, and raise them to a proper temperature (about 86° Fahr.) That of the wards being about 60° Fahr. This arrangement provides about 2500 to 2700 cubic feet per hour to every patient, 2300 feet of which come through the flues. The vitiated air escapes by openings at the upper part into branch flues, leading to a common upshaft, and thus reaches the outer air. This shaft has no contrivance for heating its interior to hasten the draught, because it was intended that the evacuation of the vitiated air should be caused by the impulsion of the fresh air, and by the rarefaction it receives during its passage through the ward. The first of these influences had no effect in producing evacuation, as was conclusively shown by the following experiments:

The blower, or pump, was driven as fast as it could be set in motion, while accidental sources of air, such as open windows and doors, were cut off, that the extreme power of the pump might be ascertained. The quantity of air issuing from the flues having been carefully noted, the blower was stopped, while the means of access of air remained the same. The volume of air which then issued from the flues was solely due to the rarefaction power of the system, and its amount was found to be one-third less than that of the first.

But when new apertures were made into the air-chamber, to permit a readier approach of air to the flues, this loss of one-third was made good. This equality, moreover, was not upset when the pump was again set in motion, for this time the result appeared about the same in the various wards, whether the blower worked or not.

While the blower was in full motion, and the windows, &c., closely shut, the barometric pressure without and within the ward was carefully observed, and a slight preponderance was found to exist outside, for at no time was the density of the air greater within the ward. In this way the supposition that the pump was able to expel the air from the ward by the pressure of that it drove in, was at once disproved, and the rarefaction power was shown to be sufficient, imperfect as it was, to withdraw the air faster than the pump could drive it in. The quantity of air passing out of the wards being always greater than that introduced by the flues, the deficit was supplied through the doors and chinks of the windows.

The removal of the foul air under this system was unsatisfactory. When the windows were shut, its extraction continued with tolerable regularity at the rate of 2500 to 2700 cubic feet per bed per hour; but if free opening of the windows was attempted, the exit of the vitiated air at once became disturbed, and, in high winds, reflux of foul air into the wards was observed, while the quantity evacuated diminished to about half its usual amount. This irregularity was, no doubt, caused by the want of appellant power in the up-shaft itself, and is a very serious disadvantage of this system.

A peculiarity of this system, worth dwelling upon because it has been advocated by ventilating engineers, and, unless carefully examined, appears a valuable arrangement, is this: to ensure a supply of pure air to the forcing-pump a tube was carried from the belfry of the chapel to the air-chamber of the pump, in the basement of the building; the air thus obtained would be, it was hoped, quite free from the impurities contaminating the air near the earth's surface. The experiment showed that when access of air to the chamber, except through the long tube, was prevented as carefully as possible, only half the air which reached the wards through the flues came from the belfry of the chapel; even more, if the doors of the air-chamber were but loosely closed—as, of course, often happens, only one-fourth part of the air came down the tube the rest must, in both cases, have entered the flues through joints and chinks. These results make it clear that considerable disadvantages attend this plan for obtaining air from a pure source, and that its adoption induces a false security, for under the impression that the air they were driving into the wards was pure, the inventors were supplying air taken from cellars, and other localities of a suspicious kind.

Another disadvantage of circulating air through tubes is the impediment friction causes to its flow; this is common to all plans where air has to pass through narrow channels, but where, in addition it is impelled into the flues, a considerable amount is lost by leakage through the joints during its passage, the amount lost being proportionate to the imperfections and length of the tubing traversed, and, in this instance, was about half the volume impelled.

General Morin, Directeur du Conservatoire des Arts et Metiers, at Paris, and the most active member of the French Commission, was anxious to ascertain how much obstruction to its passage a current of air received by passing through narrow outlets, and conducted some experiments with the view of measuring the impediment, from which it would appear that the difference in the volumes which passed apertures of different sizes, other things being equal, was in proportion to the difference of the square-root of their areas. The velocity of the current was accelerated through the smaller openings, and yet this increased flow did not restore the balance.

These various observations show that air-conveying tubes must be short, capacious, and as straight as possible, and also that serious loss must take place when air is forced through them. If air be drawn instead of driven, the leaks are of less consequence, as they help to supply the quantity arrested by the friction, though the air they contribute is from suspicious sources.

Another plan of ventilation in which mechanical pulsion is employed is that of Dr. Van Hecke; but this apparatus, tested at the Vesinet Convalescent Institution and Necker Hospital, was so defective in its working, and the ventilation it effected so obviously inferior to that of the other two systems, that a description in this place is unnecessary. Dr. Van Hecke has in some instances applied his pump to force fresh air into the wards; in others to drive the foul air out of the space to be ventilated. In the first, in consequence of the want of a good plan for providing a steady draught, the removal of the vitiated air was very defective; in the second this was more regular, but the supply of fresh air was insufficient. The inferiority of Van Hecke's method was so evident, that it did not long engage the attention of the Commission.

Third Class.—By this method most English hospitals are ventilated; and if the rooms are large and lofty, it is a tolerably successful one, though, of course, it must be frequently interrupted by bad weather.

An adaptation of this kind is a plan recommended by Dr. Roberton, in his article on "Hospital Construction," published in the 'Transactions of the Manchester Statistical Society' for 1858. That gentleman suggests the construction of openings in the walls of the ward near the ceiling, placed opposite to each other, protected by a wide-meshed grating. The external currents of air flow through these openings, and sweep away in their course the vitiated air as it rises to the top of the room, without causing violent draughts in the lower part. This method is, perhaps, the best in which external currents can be employed in ventilation, but by itself is insufficient, as no provision is secured for carrying on the ventilation when inclemencies of weather necessitate the closure of these apertures. Also the quantity of air admitted by this means cannot be accurately measured. It is probably more than 2000 cubic feet per bed per hour, because it suffices to preserve the atmosphere in a sweet condition, which that quantity failed to do at all times in the Lariboisière Hospital, notwithstanding the scrupulous cleanliness practised in other respects.

From this summary of the experiments, it is evident that many erroneous conclusions exist of the efficacy of different methods of ventilation, especially of those in which impulsion of air is employed as a means of creating circulation. While from the results of the experiments the following principles for guidance in contriving a system of artificial ventilation may be extracted. These are—

1. 2000 cubic feet of air per hour is about the minimum quantity which suffices to preserve a wholesome atmosphere in an enclosed space occupied by human beings.

2. Rarefaction can supply a sufficient quantity if the rarefaction be created in an upshaft; so that the cause of the draught of the vitiated air is removed from the influence of adverse currents of air.

3. Impulsion of air into a space is an inferior means for procuring a circulation than exhaustion from it by rarefaction.

4. Currents of air are much retarded by passing it through narrow channels, and the available supply is much diminished.

5. Pure air can be obtained with certainty only by admitting it directly to the apartment. The longer it is detained in tortuous passages, the more it is contaminated by air from accidental sources; hence arrangements for bringing air from a considerable height above the earth's surface defeat their object by the leakage they cause.

6. Ventilation by rarefaction, properly conducted, is not disturbed by free ventilation through open windows, when the latter is desirable as an auxiliary, and it affords a permanent and steady supply of air at all seasons of the year, when windows cannot be opened.

The system of Duvoir Leblanc, by this examination, was shown to be, in the opinion of the French Commission, decidedly superior to either Farcot's or Van Hecke's, from its greater excellence of principle. It was the system selected for the ventilation of the Palais de Justice, after having received improvements in the mode of admitting the air, suggested by the observations made on its working at the Lariboisière Hospital.

The plan adopted for ventilating the two new theatres of the Place du Châtelet is a modification of this rarefaction in the evacuating-shaft, being the means of procuring a circulation of air.

The theatres are warmed by means of air heated in furnaces, instead of over hot-water pipes, because in this way the rise of temperature is most rapid; also because the fresh air needs little artificial warming after the audience is assembled, when the heat generated in the furnaces can be conveyed at once into the evacuating-shaft, to increase the draught.

The circulation of air through the theatres is contrived in a very ingenious way. In order to prevent the rapid draught of air from the stage to the shaft over the central gaselier occurring in ordinary theatres, but which is of very little service in ventilation, as it does not affect the air surrounding the audience, the mouth of the shaft is no larger than will permit the escape of the products of combustion of the gas-jets. This small quantity of air is very highly heated, and tends to quicken the draught through the main shaft into which it rises. It is aided in this by other accessory sources of heat, which are —a group of gas-jets burning in the shaft; the passage of the furnace smoke-flue through it; hot air brought direct to it from the furnace; the products of combustion of the foot-lights, &c., which are led up to the main shaft by separate flues. A rapid exhaustion and rarefaction results from this supply of heat, which is utilized in the following way: exit-flues communicate with the theatre in the floor of the pit, in the boxes, and between the rows of seats of the galleries; and the foul air is sucked away through the flues from among the audience where it is generated, whither also it is necessary to lead a fresh supply. This fresh supply is poured into the theatre by an ingenious arrangement, which is devised as follows: beneath the pit of the theatre are placed two large air-chambers, where the cold air is mixed with the hot air from the furnace, and thence drawn along flues into the theatre by the exhaustion going on there. These flues are conveyed to various parts of the house, and project fresh air into the theatre along the front of the stage, at the wings, and in front of each tier of boxes, on a level with its floor. The currents of air thus made to blow directly into the theatre lose their force and direction before they reach the audience, to whom a steady, imperceptible current of fresh air is induced by the abstraction going on around them. The amount of air estimated as supplied by this method is 1500 cubic feet for each spectator when the theatre is two-thirds full; when quite full, the supply is about 1000 cubic feet. Means for introducing an additional quantity are provided for the summer requirements. The success of this method of ventilation is decided, though not quite so perfect as is desirable. During the recent hot weather I had an opportunity of comparing the atmosphere of these two theatres with that in the older ones ventilated by the ordinary method, and the comparison was much to the advantage of the new theatres.

The cost of the different systems of ventilation was calculated by the Commission at the following amounts:

	Duvoir.		Farcot.		V. Hecke.	
	£	s.	£	s.	£	s.
Cost of erection per bed . .	19	0	32	0	9	10
Annual cost	2	9	3	16	1	9
Ditto with 10 per cent. on first outlay . . .	4	7	9	0	2	8

The cost of 1,000,000 cubic feet under the different systems, supposing Duvoir and Farcot to supply each 2500 cubic feet per hour, and Van Hecke 1400 feet :

Duvoir.		Farcot.		V. Hecke.
4*s.* 0*d.*	...	6*s.* 4½*d.*	...	3*s.* 11*d.*

But it must be recollected that Van Hecke's system is very irregular in its working; and consequently the estimated 1400 cubic feet is little more than a guess. It may, therefore, be considered more costly than Duvoir's, as well as less efficient.

This account of the testing to which these systems were subjected renders it clear that the only plan of ventilation thought worthy of further adoption by the French Commission was one which had exhaustion by rarefaction for its principle of construction. All the plans of ventilation were insufficient in the amount of air supplied; but the experiments of the Commission showed that this difficulty is most easily surmounted in the plan of ventilation by rarefaction, where the supply appears to be illimitable with a well-arranged apparatus. This description, I trust, will serve to render these principles of ventilation more familiar to those interested in this subject.

Art. II.

Sketch of the Geography of Epidemic Yellow Fever since the Close of last Century. By Gavin Milroy, M.D., F.R.C.P., President of the Epidemiological Society, &c.

After an absence of a good many years, yellow fever in an epidemic form manifested itself afresh about 1793 in the West India Islands, and at several points of the American Continent, between Guiana to the south, and the seaboard of Pennsylvania and New York to the north. The imperfect data on record seem to indicate that Grenada, Dominica, Barbadoes, and Jamaica were among the British islands first attacked; but that, prior to their invasion, the disease had been prevailing in Charleston and other southern cities of the United States, as well as on the coast of Guiana and the adjacent settlements.

The expeditionary force under Sir Charles Grey, sent from this country soon after the outbreak of the great revolutionary war for the capture of the French West India colonies, arrived in those latitudes in the early part of the epidemic season, and at once encountered the pestilence. During the reduction of Martinique, St. Lucia and Guadaloupe, and the subsequent occupation of St. Domingo in 1794, the loss of life among our troops, chiefly from malignant fever, was enormous. Of the 10,000 men composing the force, 6000 perished within a few months. Several regiments returned to Europe, after a short stay, mere skeletons of what they were. The 82nd lost within twelve months of their arrival in the West Indies upwards of 800 rank and file and officers, and mustered on their return not men enough to complete the number of their non-commissioned officers! Part of the 92nd also, engaged in St. Domingo, "were soon exterminated to a man." The whole of this dreadful mortality was not due to yellow fever alone, however fatal this epidemic pestilence then proved to be; for in former years, when it was scarcely if at all prevalent, our troops had still suffered disastrously from the ordinary endemic fevers of the tropics, and also from dysentery. These were the days (and unhappily they continued for long afterwards), when the subject of climatic and other such influences on the health of the soldier was never dreamt of by governmental authorities; and when, in estimating the chances of success of a military expedition, human lives were looked at in much the same light as the powder and shot, or the muskets and sabres shipped off at the same time;—if they were good and serviceable in one place, why should they not be so in any other?

The epidemic of Philadelphia in 1793-4 is memorable from being the occasion of Dr. Rush's celebrated 'Essay' on the disease. In 1794 the cities of New York, Newhaven in Connecticut, Baltimore, Charleston, &c., suffered more or less severely; and the fever seems to have reappeared in most of them during the next two or three years.

Humboldt states that, after an absence at Vera Cruz of the disease in the epidemic form since 1776, and in the sporadic form since 1786, it broke out there in 1794. This alternate cessation and reappearance is a character common to yellow fever with other epidemic diseases, and must have been strangely overlooked by Dr. Chisholm and other writers of that day when they imagined that the malignant pestilence of 1793 in the West Indies, &c., was a new and foreign distemper, imported by a sickly ship from the West Coast of Africa! From that year till towards the close of the century, it prevailed with varying force not only in many of the islands of the Caribbean Sea, but also along the coast of Mexico, as well as in numerous parts of the United States—from Louisiana and South Carolina to New Hampshire. Nor was the South American continent exempt from the baneful influence; for, besides Guiana and other regions within the circuit of the Mexican Gulf, it now appears from the very interesting communications of Dr. Archibald Smith, recently brought before the Epidemiological Society, that a malignant fever having many of the attributes of yellow fever was prevalent about the same time in many districts of Peru, and caused great mortality among the inhabitants. This is but one of many instances which show that just as our opportunities of information respecting the occurrence of epidemics enlarge, so do we find occasion to believe that their geographical diffusion is often far more extensive than has been usually supposed.

The commencement of the present century was signalized not only by the return of yellow fever in the West Indies and the United States, but also by its appearance (after, it has been stated, an absence of more than thirty years), in the south of Spain. It was at Cadiz that, according to the generally received report, it first manifested itself. The weather there, in the early part of 1800, is described as having been unusually irregular; and, as the year advanced, the heat became extreme, and at the same time intolerably oppressive from the prevalence of the east wind, or "Levanter." About the beginning of August a fever, remarkable for the singularity and violence of its symptoms, and the rapidity of its fatal course, made its appearance in the Barrio di Santa Maria—a low, crowded, and filthy locality, the resort of merchant seamen and the lowest classes of the people. It was at first confined to this district; and not till the deaths had considerably increased and cases had occurred in other localities, was the true nature of the fever recognised. Thereupon it was rumoured that it had been brought by a vessel from South America, and introduced on shore by smugglers—an explanation that has frequently been had recourse to by quarantine authorities for solving such difficulties. By the middle of September, the daily deaths amounted to two hundred out of an estimated population of nearly 58,000. The total mortality at the end of October, when the disease had nearly ceased, was upwards of 7000. During the height of the sickness, the air was described as being so stagnant and vitiated that many of the lower animals were attacked with symptoms like those that occurred among the human race, and numbers of them died.

Besides Cadiz, the neighbouring towns of Port St. Mary, Xeres, Seville, &c., and also the city of Malaga, were the seat of the disease during the autumn. Seville lost between a sixth and a seventh part of its inhabitants; and in Xeres the mortality was returned at 10,000. Gibraltar, too, this year was so unhealthy, although the exact nature of the sickness has not been ascertained, that the mortality in the garrison, then usually between four and five thousand strong, was during that season nearly four times as high as the average had been during the preceding four years.

Dr. Trotter states[1] that in the autumn of 1799 a bilious fever, with many characters of the yellow fever of the West Indies, prevailed to a considerable extent at Gibraltar; and it is noteworthy that at the same period the towns of Ceuta and Tangiers, on the opposite side of the Straits, were affected with a malignant fever of a similar nature. And some accounts state that other places, such as Cette in the Gulf of Lyons, and the city of Genoa, suffered much this season from a like sickness.

In 1801, yellow fever reappeared during the summer months at Cadiz and Seville; and in October it showed itself at Medina Sidonia, situated thirty miles inland, and intermediate between Cadiz and Gibraltar;—the garrison of the latter place continued unusually sickly throughout the year. The islands of Martinique and Dominica are known to have been the seat of yellow fever in 1801.

In the two following years (1802–3) the disease seems to have been more widely spread. Many of the West India islands suffered severely, as did also Charleston, Philadelphia, and other cities in the United States. Malaga was affected in both years—the earliest cases there always occurring in July and August—and Cadiz in the autumn of

[1] Vide 'Medicina Nautica,' vol. ii. p. 428. Dr. Donald Monro, in his work on the Health of the Army, published last century, says that in the hot months—June, July, August, and September—the garrison and inhabitants of Gibraltar are subject to bilious and putrid fevers, and that new comers seldom escape them in a violent degree.

1803. Some suspicious cases also occurred at Gibraltar during this season.

1804 was notable for the unusual prevalence and fatality of the fever in the south of Europe. Gibraltar was the seat of a most destructive outbreak among the civil and military population. The summer had been more than ordinarily hot from June to August, and excessively oppressive by the stagnancy of the atmosphere and the prevalence of the easterly sirocco winds.[1]

The first distinct cases occurred, about the end of August, in a crowded house in one of the filthiest quarters of this (at that time) most filthy garrison town. For some time the fever was confined to the immediate neighbourhood, but ere long (middle of September) it began to manifest itself in different localities, and soon involved the whole community. It continued till towards the end of the year. The garrison, about 3500 strong, lost in three months 864 men and officers, besides 164 women and children. Of the civilians, 4864 perished out of a population of between fifteen and sixteen thousand.[2] Many of the inhabitants left Gibraltar when the true nature of the disease became known, some for the coast of Barbary, others for Malta, where they were permitted to land at once, as there was no suspicion at the time of the kind of fever existing at Gibraltar. As soon as the truth was known, the most rigorous quarantine regulations were immediately enforced, not only in Malta but in all the other ports of the Mediterranean. No ill effects, however, occurred anywhere from the arrival of the fugitives.

Between the months of June and December of this year, the whole of the south and south-east of Spain appears to have been more or less infected. Numerous towns in the provinces of Cadiz, Seville, Cordova, Malaga, Granada, Murcia, Alicante, &c., were the seats of the fever. The earliest cases occurred in Malaga as early as June; but in most of the other cities the disease did not appear till August or the beginning of September. It seems to have generally reached its acme in September and the early part of October.

It was in August of this year that a malignant fever, regarded as yellow fever, broke out in the port of Leghorn, soon after the arrival, it was said, of a sickly vessel from Havanna. More than 6000 of the inhabitants, and many of the French troops which at that time occupied Tuscany, fled to Pisa; but the disease did not spread beyond the suburbs of Leghorn. No other place in Italy seems to have suffered; nor was even Marseilles affected, although vessels from Malaga, Alicante, and Barcelona frequently arrived in the port with cases of yellow fever on board. Whether the formidable epidemic, supposed to be the yellow fever, which raged in Corfu about this period, and which generally proved fatal on the fifth or seventh day,

[1] "While the easterly wind blows, the sewers throughout the town emit the most offensive vapours. . . . . Such were its deleterious effects upon the wounded after the bombardment of Algiers (1816), that the *Leander* frigate left the station without waiting for supplies—a privation which was amply compensated by the improved state of the invalids as soon as they were removed."—*Hennen.*

[2] Sir Gilbert Blane, Second Report on Quarantine, &c.

was really that disease, there are no means now of determining. (*Hennen.*)

In 1804–5 the fever was destructively prevalent in the West Indies and the southern ports of the United States. The British fleet, as well as our troops in the West Indies, appear to have sustained heavy losses in consequence. The mortality in the fleet in 1804 is stated by Sir G. Blane to have been nearly three times greater that year than it was in 1782, when, in addition to the ordinary causes of death on the station, the great naval action under Lord Rodney was fought. So sickly were some of the ships that in one frigate, says Sir Gilbert, there were no fewer than 170 cases of fever, and of these 26 were fatal, on board. The deaths in the naval hospitals at Jamaica and Antigua amounted during the year to 727.

Between 1804 and 1810 yellow fever, which for the first three or four years of the century had not been out of the south of Spain, was entirely absent from that country. Cases began to appear during the month of September, 1810, at Cadiz, in the very same crowded and filthy locality where it had first manifested itself in 1800 and again in 1804. The town at the time was exceedingly crowded with thousands of persons flying before the invading French forces. On this, as on the former occasions, the origin of the disease could not be traced to any extrinsic source, although the general belief then and subsequently in Spain has been that it must have been introduced from abroad. The city of Carthagena suffered severely during the autumn: more than 3000 died from the fever. Malaga appears to have escaped, or to have been only slightly affected, in 1810. In October of that year a pestilential fever—similar, it was stated, to the fever which had prevailed in Spain in 1800 and 1804—broke out in Santa Cruz in the island of Teneriffe. It was believed by the islanders that the disease had been brought by a vessel from Cadiz, with French prisoners on board.[1]

The visitation of yellow fever at Gibraltar in 1810 was comparatively slight, although the atmospheric peculiarities of the season are described as having been very similar to those of 1804.

During 1811–12 Carthagena and several other towns in Murcia, then occupied by the French army, appear to have been the principal seats of the disease between the months of July and September. The province of Valencia also suffered in 1812. In that year a dreadful mortality occurred among a body of recruits, about seven hundred in number, that had been brought in a large transport from Alicante to Cadiz. In consequence of the delay in landing them, more than a seventh of the whole perished on board; upwards of five hundred had been smitten with the fever.

1813 was a very sickly year throughout Spain, which was still the

[1] In March of this year (1810), a dreadful mortality occurred among the poor French prisoners, captured at Baylen, on board the hulks in Cadiz bay. "The extreme misery and filthy state of these men," says Sir I. Fellowes, "labouring under every depression and privation, gave rise to a malignant fever of so contagious a nature, that all the Spanish guards and hospital assistants who were employed amongst them caught the disorder, of which many died."

seat of war and its attendant miseries. Cadiz was again the seat of yellow fever, the earliest cases reappearing in the old locality, where the disease had first occurred before. At Gibraltar, too, there was a great amount of sickness both on shore and among the vessels of war and others in the bay, on the accession of the summer heats. Suspicious cases began to present themselves in "Boyd's Buildings," the notorious fever-nest of the town; and, ere long, other filthy and crowded districts became the seat of attacks of malignant fever. At this time four transports, crowded with deserters from the French army in Carthagena, arrived in the bay. As several cases of fever had occurred during the voyage, no communication with the shore was permitted, and the mass of human beings continued to be cooped up in the sickly ships until two empty hulks could be procured to separate the unattacked from the sick. Almost all the men who were transferred to the hulks escaped, while most of the crew and others who were not removed were smitten, and very many died. A similar fact occurred on shore. Upon the breaking out in force of the fever, nearly 8000 of the garrison left the town and encamped in huts or tents on the neutral ground. With the exception of a few attacks soon after their removal, the whole body remained healthy.

It was in the autumn of this year that several cases of what was considered to be yellow fever occurred in the depôt barrack at St. Andero, on the coast of Biscay. By removing the men from the barrack, which was found to be foul and unwholesome, to a healthy locality, the disease soon ceased. In reference to these cases, Sir James MacGrigor wrote:[1] "As transports are but ill accommodated for the conveyance of wounded men, or those labouring under dysentery or fever, they often suffered much on the passage: hospital gangrene spread, cases embarked as synochus landed as typhus, and some assumed the appearance of typhus icterodes. The few cases of this last disease, which appeared at St. Andero, by no means justified the Spanish government in subjecting our hospitals to the rigour and inconveniences of the Quarantine laws."

In 1814, there was a partial reappearance of yellow fever in Gibraltar; the disease commenced this time in "Cavallero's Buildings," considerably higher up than "Boyd's Buildings," and rivalling the latter in impurity and general unwholesomeness. After this year, Spain seems to have been nearly, if not quite, exempt for the next five years. During this interval, and more especially in 1817 and 1818, the pestilence is known to have prevailed in several of the West India islands, as Antigua, Dominica, Jamaica, and Guadaloupe, &c., and also in the Southern States of the American Union; but my memoranda are too imperfect to enable me to follow its course.[2] At Sierra Leone, it appears from some meagre notices, that an

[1] Med.-Chir. Trans., vol. vi.

[2] For seven or eight years after 1807–8, there seems to have been a lull in the epidemic force of the fever in the West Indies generally, and also in the Southern United States—at least in Charleston.

epidemic commenced in 1816-17, and continued for several successive years.

1819.—"This year," remarks Dr. Hancock, in his valuable work on the Laws and Phenomena of Pestilence, "was remarkable for the general spread of epidemic and pestilential diseases over the world. Their unusual prevalence was announced from all the four quarters of the globe. India, and the east and south of Europe, as well as the north-west parts of Africa, were visited by the form of disease peculiar to their several climates. Nearly all the West India islands, with the adjacent shores of the American Continent about Demerara and New Orleans, were ravaged with pestilential fevers. Disease was so prevalent in the cities of the United States, that the President thought it a subject deserving notice in his opening speech to Congress." In Spain, yellow fever prevailed in different parts of Andalusia, more especially in Cadiz and Seville. In the former city, it began in July, and, notwithstanding all the attempts at first to conceal its real nature, the truth soon became manifest, and the disease rapidly spread in the low and crowded districts in spite of the most stringent quarantine barriers around the infected localities. So great was the alarm at Madrid, that the central junta decreed the punishment of death against any person entering the capital from the diseased province without a proper certificate of health!

In 1820, and again in 1821, the fever reappeared in Cadiz and other towns in Andalusia, and also in Malaga. It was in 1821 that the disastrous outbreak of the pestilence occurred in Barcelona, the great seaport of Catalonia, the north-eastern province of Spain. It began in July, and by the middle of August had spread so much that all the authorities fled, and a military cordon was drawn round the city to prevent the escape of any fugitives. But ere long it appeared beyond the cordon, at Tortosa on the coast to the south of the Ebro, and in the inland towns of Mequinenza and Lerida. The fever reached its acme in Barcelona about the middle of October, and ceased in December. The mortality had been enormous both there and at Tortosa.

In the West Indies and United States, 1819 had been followed by another very sickly year. Yellow fever seems to have clung to Baltimore in 1821 and 1822; and in this latter year New York was revisited.

In 1823, Sierra Leone and other parts on the north-west coast of Africa, are known to have been the seat of the pestilence. Several of the West India islands also suffered severely. The isolated partial outbreak at the port of Passages, close to St. Sebastian, in Biscay, occurred in August. It was connected with a vessel recently arrived from Havanna; there had been no sickness on board, and she had been kept in quarantine for ten days as a precaution. It was on the opening of the hold and the discharge of the cargo that the first attack occurred, and in the persons of strangers from the shore. Of twelve carpenters employed in removing the rotten timbers of the hold, six were attacked in rapid succession. Several cases occurred on shore in some filthy crowded houses near to where the ship was moored. But the disease did not spread, and soon ceased.

This year occurred also the oft-quoted case of the outbreak at Ascension, in connexion with H.M.S. *Bann*, recently arrived in a sickly state from Sierra Leone; she had lost fifteen of her crew during the voyage, and there were forty-five men sick on reaching the island. They were immediately landed and put under tents. The virulence of the fever among the crew speedily diminished; but the garrison was attacked during the third week after the arrival of the ship, and of 43 cases 21 proved fatal.

In 1827, the fever was very prevalent in several of the West India Islands; Jamaica and St. Thomas were particularly unhealthy. Charleston and other cities in the Southern States of the Union were also much affected.

In 1828, the disease reappeared at Gibraltar after an absence of fourteen years. The earliest cases were observed about the beginning of August, in a district thus described by Dr. Hennen, then principal medical officer of the garrison, and who, himself, fell a victim to the epidemic:—"The population dense to a degree incredible except to those who have seen it. In sheds, without ventilation, without drainage, and generally composed of the slightest materials; in tiers of beds as close as in a crowded transport numerous individuals sleep; they go out to their work at an early hour and return at gun-fire, locking up their miserable places of nocturnal shelter during the day, and leaving them saturated with the steams of their bedding, their food, and the overflowing receptacles of their ordure." Dr. Hennen, who was also health-officer of the port, failed to trace the disease to importation from abroad, and was satisfied that it was of local origin; and Sir W. Pym himself, having been sent out from England to investigate the history of the disease, acknowledged that its origin was very obscure. It is to be remembered that, prior to this, the last, epidemic of yellow fever at Gibraltar, sporadic cases of aggravated bilious remittent, proving fatal with black vomit, &c., had occurred almost every year during the autumn. The following table gives the mortality in the five successive epidemics during the present century:—

	Mortality.	
Years.	Military.	Civil population.
1804	869	4864
1810	6	17
1813	391	508
1814	114	132
1828	507	1170

1829.—After the cessation of the fever, in the epidemic form, for several years in Sierra Leone, it reappeared there, and continued to prevail during this and the following year. Many of our ships of war on the station suffered most disastrously; the frigates *Sibylle* and *Eden* lost nearly a hundred of their crews, and some of the smaller vessels sustained proportionately heavy losses.

Between 1831 and 1837–38, there was a similar lull in the pestilence on the African coast to that which had occurred prior to 1829. This seems to have been the case also at Charleston and other ordinary seats of the disease in the New World. 1837–38 was a remarkably sickly epoch in the history of yellow fever. It prevailed with great malignancy at Gambia, Goree, and Sierra Leone, committing terrible ravages both on shore and among our African squadron. In 1838, the island of Ascension experienced its second visitation, several weeks after the arrival of H.M.S. *Bonnetta* in a sickly state from the African coast. The surgeon of the garrison regarded the fever as of local origin; and Dr. Bryson, although of opinion that it was imported, admits the impossibility of tracing the mode of its introduction.

British Guiana, which had been nearly exempt since 1819, suffered severely during 1837–38; and for many years subsequently the colony continued to be infested with sporadic cases, or clusters of cases, of the disease, in the usual sickly season. At the same period of the year it prevailed extensively in the West India Islands, as at Cuba, Jamaica, Barbadoes (the military were the chief sufferers), Martinique, Dominica, &c. In October, 1837, the disease appeared at Bermuda, where it had not been seen, except in a sporadic form, for eight or nine years previously. All classes of the community suffered. The fever did not extend beyond the small island in which it arose, nor to any of the ships of war in the harbour, unless their crews had personal communication with the shore, as was the case with the ship's company of H.M.S. *Pearl*, then recently arrived from England. In the naval hospital, where there were 134 cases treated, of which 21 died, it did not attack any individual belonging to the establishment, whether white, black, or coloured. The disease was regarded at the time as of endemic origin.

The next visitation of the fever in Bermuda occurred in 1843, during which year, as well as in 1841–2, and again in 1844–5, New Orleans, and several other towns in the Southern States, suffered much from its ravages. In 1842, the disease appeared in the city of Guayaquil, on the West or Pacific side of South America, about 3° S. lat. It continued to reappear in that city, and its immediate neighbourhood for two or three successive seasons; but it did not spread to other towns on the Peruvian coast, notwithstanding the unchecked intercourse.[1]

Whether the pestilential fever mentioned by Ulloa to have prevailed at Guayaquil in 1740 was genuine yellow fever, or not, it is impossible now to determine; it was very fatal, and seems to have been accompanied with hæmorrhagic symptoms.

In 1845, British Guiana was partially visited; but this year is chiefly memorable in the history of yellow fever as that of the disastrous mortality in H.M.S. *Eclair* on the north-west coast of Africa, and the occurrence of the disease at Boa Vista, one of the Cape de Verde groupe, in 17° lat. N., within a short time after the

[1] At a later date (1852), the disease reappeared in this region, and spread much more to the southward.

ship left the islet where she had landed her sick. The previous season there, and on the African coast, had been sickly. It would be out of place here to enter into a detailed account of this melancholy episode; suffice it to say, that the circumstances connected with the fatal sickness in the *Eclair* on that occasion, and of her subsequent unhealthiness for years afterwards, ought, ere this, to have led to improved hygienic arrangements generally in our ships of war. At the same time, a hope may be expressed that recourse will never be had in future to such measures as were adopted upon her arrival in this country, but that the unattacked portion of the crew on board a pest-ship may, on all occasions, be as promptly as possible removed out of her into a pure and wholesome atmosphere, so as to prevent the further extension of the disease.

In 1847, a fresh epidemic occurred at Sierra Leone, which for some years previously had been comparatively exempt from the disease. Dr. Lawson, then the medical officer of the troops, remarks that it commenced in June, that then the cases of the endemic remittent took on the form of yellow fever, and that subsequently, when the latter subsided, the former type began again to prevail. As on all former occasions, the disease was almost exclusively confined to the lower part of the town; it did not appear to be contagious. It seems to have manifested itself about the same time at two or three other places on the coast, at some distance from Sierra Leone. In this year, New Orleans experienced a most destructive visitation. Some of our West India colonies were also extremely sickly. The troops at Barbadoes suffered much from yellow fever in 1847, and again in 1848–49. The ill-drained barracks of St. Ann's had always been infested with the disease in epidemic seasons. In the latter year, the military at Antigua were attacked; and, after an exemption of several years, Charleston and other Southern States in the United States were revisited.

This year was remarkable along the coast of Brazil for what are usually regarded as the evidences of a distempered atmosphere—viz., excessive heat, great drought during the summer, occasioning enormous mortality among the cattle, the entire absence of thunder-storms, generally so frequent during the hot months, the irregularity or total absence of the summer breezes, with a prevailing stagnancy of the air. Later in the season, heavy rains fell in many parts; but the same close and oppressive state of atmosphere remained. Gastric affections and typhoïd fevers had been more than commonly frequent and severe in Rio Janeiro throughout the whole season. For two or three years previously, a change in the character of the most prevalent diseases had been observed by the resident medical men. The ordinary endemic fever had been becoming less and less remittent, and more decidedly continued in type; so much so that many cases were regarded as of a new form of fever, to which the appellation of "insolation fever" was given, and which resembled, it is said, in many respects, the milder cases of yellow fever. These occasional cases became from year to year of a more aggravated and fatal character, and in several instances the matters vomited had much of the appearance of the true "black vomit."[1]

It was in the month of November, 1849, that the earliest cases of recognised yellow fever were reported in the large commercial city of Bahia, in lat. 13° S., having a population of about 140,000. The city, it was stated, had been unusually healthy—the mortality, at least, had been low—for some months previously, notwithstanding the close and oppressive condition of the air, and the more than ordinarily polluted state of the shore-water in the bay from various causes of insalubrity.

Within a week or two after the first cases, the disease rapidly spread to different parts of the town and suburbs, and the shipping in the harbour became affected about the same time. It was remarked that collier vessels suffered more than others. The fever seems to have reached its acmé in February and March; it lingered, however, in the place till the following September. It may deserve notice that, at the very time when the earliest cases of yellow fever occurred in Bahia, arrivals from Europe and the United States were being put into quarantine there on account of another pestilence, which had not then found its way to Brazil—viz., the malignant cholera; and also that clean bills of health continued to be given to vessels leaving Bahia until near the end of January. Such are the anomalous absurdities of quarantine, as hitherto exercised, for the defence of public health!

In the course of December, cases of the same fever were observed on the coast, both to the north and to the south of Bahia, as at the large port of Pernambuco, in lat. 8° S., at Maceio, lat. 9° 40′ S., and also at Rio Janeiro, the capital of Brazil, in lat. 23° S. It is impossible to determine with any exactness the earliest appearance of the disease in either place, as the resident medical men differed in opinion upon this point. The first decided attack of the fever at Rio appears to have occurred in the low lodging-houses of the town frequented by sailors, and which, as usual, were situated in a filthy, narrow street, not far from the foul beech where many of the merchant-vessels were moored, and whose abominably offensive condition will be remembered by all who have landed there. From these places the disease appeared to spread to other parts of the town, and also to the shipping. The fever attained its height in March, abated considerably on the setting in of the cool weather in May, and ceased by the end of July, after causing great mortality.

The shipping, men-of-war as well as merchantmen, in the harbour suffered much during the epidemic. Some vessels escaped almost entirely, although they were in as frequent communication with the

[1] It has been asserted, though probably upon very insufficient grounds, that Brazil had been entirely exempt from any visitation of yellow fever for more than a century prior to 1849. Other accounts state that the disease had occurred not only sporadically, but as an epidemic, on various former occasions, as in 1720 and 1780. (Edin. Monthly Journal, vol. xv.) There can be no doubt that during the last fifteen years, Rio Janeiro and the other great ports have been far more unhealthy than previously. They have suffered much from cholera, as well as from yellow fever. Formerly, the Brazilian station was one of the very healthiest for our ships of war; of recent years, several vessels have sustained heavy losses from epidemic diseases.

shore as others that became infected. This was the case with H.M.S. *Crescent*, a dismantled frigate for the reception of liberated Africans, which lay in the harbour the whole season. Many vessels which left Rio for Monte Video had cases, often fatal during the voyage, and arrived with the disease on board; but in no instance that season did the disease spread in the La Plata river, either on shore or to other vessels which communicated with the infected ones. On the other hand, it has been confidently stated that several vessels direct from Europe were attacked with fever when they neared the coast of Brazil, and that some actually arrived at Rio with cases on board. These cases were generally mild, and doubts were therefore entertained as to their true nature. Some of the physicians in that city were, however, of opinion that the mildness of the attacks was merely due to the greater dilution of the atmospheric poison, and to the more favourable condition of the sick out at sea than in harbour or on shore.

In 1850 various other towns on the coast of Brazil became the seats of the fever, as Para, Parabibo, Paranagua, Santos, Mangaratiba, Guarapasi, and Campos. Maranham and Ceara were not visited till the following year. Towards the end of 1856, Cayenne or French Guiana, on the north boundary of the Brazilian Empire, was infected, and a fearful loss of life ensued. The colony is said to have experienced only three visitations of the disease since 1762.

In the adjoining Dutch settlement of Surinam, immediately westward of Cayenne, the fever manifested itself in 1851, and somewhat later in the same season in British Guiana,[1] still farther westward along the coast of South America, where sporadic cases had for several years before occurred, but which now became the seat of an epidemic invasion which lasted, with varying intensity, throughout 1852, and did not cease till 1853. While the low, marshy province of Guiana was under the poison-cloud, its influence seems to have been extending northward and westward over the Caribbean Gulf, and along the shores of the Spanish main to Mexico and the Southern States of the American Union. The islands of Martinique, Guadaloupe, Barbadoes, St. Lucia, St. Domingo, Cuba, St. Thomas, and Jamaica, as well as the cities of New Orleans, Charleston, and Savannah, &c., all began to suffer more or less severely during the last six months of the year. Rio Janeiro had been affected in the spring; and at the end of the

[1] While in Jamaica, investigating the severe outbreak of malignant cholera in that island, I was much struck with the progressive advance of the epidemic yellow fever from Brazil towards the West Indies. In my letter addressed to the governor, March 31, 1851, is the following passage:—"I am the more anxious to awaken public attention to the necessity of measures being adopted for the preservation of the public health, as I find that an idea is very generally prevalent that there is little or no risk now of the yellow fever ever reappearing with virulence in the island, in consequence of its absence, in the epidemic malignant form, for so many years past. (There had been no epidemic for thirteen or fourteen years.) The idea is utterly erroneous, and may, if incorrect, prove very mischievous. I shall only remark that the recent severe outbreak of the pestilence in Brazil, a country which had been for a couple of centuries exempt from its invasion, and its existence at the present moment in Cayenne, and also, I believe, in Demerara, are facts which should not be overlooked."—*Official Report on the Cholera in Jamaica*, 1853.

autumn, not only was Puerto Cabello, &c., on the Spanish main, but also Callao, Lima, and other places on the Pacific coast of the South American continent were attacked.[1] It visited Lima in 1852, and during the next three years gradually spread further south along the coast, not reaching the cities of Santiago and Valparaiso in Chili till 1856.

In 1853, there appears to have been a still wider prevalence of the disease than in 1852; for not only did most places enumerated above continue to be infected, but various other West India islands, and also other cities in the United States were now visited by the disease. Among the former, Trinidad, Tobago, St. Vincent, Grenada, Dominica, Antigua, Montserrat, and among the latter Natchez, Baltimore, Brandywine, Delaware, and Philadelphia (slightly), &c. At New Orleans, the visitation this year was one of the most dreadful the city had ever sustained. Various other places in Louisiana suffered also severely during the latter months of the year. After an absence of ten years, our colony of Bermuda was revisited this year, and very fatally, more especially among the troops and the convicts; a fourth part of the garrison was swept off in the course of a couple of months; the barracks were unwholesome and excessively crowded. The bad condition of the convict hulks, too, added much to the virulence of the disease. While it is known that Bahia, Rio Janeiro, and other places in Brazil, continued to be the seat of the fever,[2] one account stated that it had extended still further south, and had appeared at Rio de la Plata. If not genuine yellow fever, it must have been some other bad form of fever. But if there was any doubt as to the real nature of the disease at La Plata, there was none respecting the sickness at Callao, Lima, and other places on the Pacific side of the South American continent, which suffered severely during the early summer of this year.

In 1854 and 1855, the diffusion of the pestilence was much less extensive than in the two preceding years. The shipping at Bahia, and some other ports in Brazil, had not entirely ceased to suffer in the early months of 1854. The Dutch island of Curaçoa is also mentioned as having been attacked about this time. In the summer of

[1] The reader will find an interesting account of this, the first well-observed, epidemic visitation of yellow fever on the western shores of South America, by Dr. Archibald Smith, long resident in Peru, in the Edin. Med. and Surg. Journ. for April, 1855. The exact period of the earliest cases could not be determined. There is reason to believe that the same, or an allied fever, but in a milder form, prevailed in the country in 1818, and also in other years, both before and after that period. From the official returns of the health of the navy, it is clear that sporadic cases of yellow fever were frequently observed along the tropical shores of the Pacific prior to 1852.

[2] It appears that many parts in the interior of Brazil were visited by a deadly fever in this year. "The Tapajos (one of the great tributaries of the Amazon, which it joins at Santarem) had been pretty free from epidemics for some years past, although it was formerly a very unhealthy river. A sickly time appeared to be now returning; 1853 was the most fatal one ever experienced in this part of the country. A kind of putrid fever broke out, which attacked people of all races alike. The accounts we received at Santarem were most distressing; the mortality was very large."—*The Naturalist on the Amazons*, by H. W. Bates. 1863. Vol. ii. p. 144.

both years, New Orleans was sickly; Charleston and Savannah in 1854, Baltimore and Norfolk in 1855. During the spring and summer of this year, the shipping in the harbour of the island of St. Thomas suffered more severely than for several seasons previously. Port-au-Prince, on the south of St. Domingo, was, at the same time, very unhealthy.

In 1856, Brazil, at various points, was still the seat of the disease. Para, from which it appears never to have been entirely absent since its first appearance there, was very sickly; and in May of this year the fever prevailed at Rio Negro, on the River Amazon, several hundred miles in the interior. Besides Guiana, some of the West India islands, as St. Thomas, St. Domingo, Jamaica, the French Antilles, &c., were affected at different times of the year. The shipping more particularly suffered. Four ships of our West India squadron sustained heavy losses, and particularly the *Malacca*, in which a third of her entire crew were cut off in less than two months. Our troops at Port Royal and Kingston were sickly in June; and, later in the season, occurred that outbreak of the fever in the barracks at Newcastle, nearly 4000 feet above the sea level, and of which a most valuable narrative by Dr. Lawson, the principal medical officer of the troops in Jamaica at the time, was published in this Review. Dr. Lawson, after a careful investigation of all the antecedent and concomitant circumstances of the disease, came to the conclusion that its development was due to local causes of insalubrity, favoured by an epidemic constitution of the atmosphere. "It will be sufficient," he remarks, "to prove the existence of an epidemic constitution in the present instance to state that, during the summer of 1856, yellow fever prevailed pretty extensively in the West Indies and around the Gulf of Mexico, and was therefore sufficiently general to warrant the conclusion of there having been something in operation beyond mere local influences." Isolated cases of the fever had occurred previously, as thus alluded to in my official report on Jamaica in 1853: "if any other proof was wanted to show that mere elevation of site will not suffice to maintain the health of troops in such a climate, the unexpected occurrence at Newcastle of several fatal cases of fever with all the characters of yellow fever, in 1849, may well give rise to serious apprehensions. These cases were clearly attributable to the operation of local impurities in the building where they occurred."

Vera Cruz was affected in the summer; nor was New Orleans entirely exempt, though the fever this year did not prevail epidemically. There was a great amount of the disease among the shipping at the Quarantine station in the harbour of New York; and from thence it extended to the shore, not only at Staten Island, but to different outlying points of that great commercial metropolis.

Bermuda was again the seat of another visitation, but which was much less severe than in 1853.

Taken in connexion with the preceding statements, the very instructive narrative of the "spotted hæmorrhagic yellow fever" of the Peruvian Andes in 1853–57, by Dr. Archibald Smith, in the 'Transactions of the Epidemiological Society,' serves to show how widely was diffused the morbific agency at this time over a large portion of the New World. The Navy Returns mention Callao as a seat of the disease in 1856.

One of the most notable events this year was the appearance of the fever at Lisbon, about the beginning of September. It did not spread widely, and the mortality in the city was only 87. At Belem, where it was first observed, the deaths amounted to 35 in all.

Next year (1857), the visitation at Lisbon was much more severe; it commenced in July and subsided in the latter part of October. Out of a population estimated at 200,000, the attacks were stated to be between 19,000 and 20,000, and the deaths to be 5652. So great was the general alarm during the prevalence of the disease that commercial business was nearly suspended for some time, and the meeting of the Legislature also was adjourned in consequence.[1] What, if any, other towns in Portugal experienced a visit, I have not discovered. It appears that Ferrol, Corunna, and some of the smaller towns on the seaboard of Gallicia, the north-west province of Spain, were infected in the month of August.

In the West Indies generally, the summer season of 1857 was one of the most sickly known there for many years past. The royal mail steamer *Oronoko*, which left St. Thomas on the 27th of June, with a crew of 106, lost 28 out of 73 that were attacked, on her passage to England; none of the 168 passengers on board sickened. Several of our ships of war on the West India station—particularly the *Brilliant*, in which there were 34 deaths in the course of five or six weeks—also lost many of their hands; and the American squadron too, in the Gulf of Mexico, suffered severely.

In some of the ports of Brazil, the disease prevailed to a frightful extent in the spring; and now for the first time (presuming that the suspicious sickness in former years was not genuine yellow fever), Monte Video, in lat. 35° S., was visited by the pestilence. It seems to have commenced there about the middle of February, and to have continued till the end of May, during which interval 1800 persons died out of a population which is usually from 25,000 to 30,000; but which, from the vast numbers that had fled, could not then have exceeded 8000.

In 1858, and again in 1859, many of the West India islands were infected. St. Thomas was seldom free from the fever, and the result was that not a few of the vessels which were detained there coaling caught it. Among others, several of the royal mail steamers had a good many cases on board during their passage to Southampton. Far more numerous, however, were the arrivals of sickly vessels in the ports of New York and Philadelphia, in both of which places there was considerable mortality among the shipping, and several fatal cases occurred on shore also. At Charleston, the number of deaths in 1858 around the wharves, &c., was such as to warrant the term of epidemic

[1] The official report of the Lisbon epidemic, by Dr. Lyons, is full of instructive details.

fever alone being applied to the sickness. In the latter part of this year, there was an outbreak of the fever at Antigua; and the Navy returns indicate that at the same time it existed at Panama. There appears also to have been a re-appearance of the pestilence at Sierra Leone and the Gambia, after an absence of a good many years.[1] Next year, 1859, the fever was still more fatal on the African coast. "It prevailed to a great extent among the civil population at the Gambia, and is stated to have cut off half the white inhabitants. The French settlement of Goree, eighty miles to the north, is said to have suffered to an extent truly appalling."[2] One of our African squadron, the *Trident*, suffered terribly; 44 out of a crew of about 105 persons died of the fever.

A partial outbreak occurred this year among the troops at Trinidad; sporadic cases had been seen in the preceding autumn. All the attacks could be traced to the barracks, which were sanitarily faulty. Of 28 cases admitted into hospital 24 were fatal. The disease did not spread to the town.

In 1860, mention is made in the Army and Navy Reports of St. Domingo, Panama, Honduras, and Brazil, as the seats of the fever. In reference to the sickness at Honduras, Staff-Surgeon Mr. Thornton, says: "It was exceptional, it being the only time that an epidemic of this disease has visited the place; and even at Belize the disease had not been seen for upwards of thirteen years. But this year's epidemic appears to have extended over the whole of central America, as various cities north and south of the Honduras settlement had suffered by one of those waves of the kind which pass over these countries." Several of our ships of war in the Mexican Gulf were extremely sickly. "In four vessels, containing about 640 men, there were, in the course of six weeks, upwards of 160 cases of yellow fever, and of these 76 terminated in death." The *Icarus* alone lost 39 men out of a crew of 110 men.

Having, in the last part of the Transactions of the Epidemiological Society, given some details respecting the diffusion of epidemic yellow fever in 1861, I shall now draw these remarks to a close. The geographical limits of the pestilence, as hitherto recorded, have been, as regards the New World, from about 43° N. lat. to 35° S. lat., on the east coast, and about 33° S. lat., on the west coast of South America. In the Old World, the limits may be said to be between 43° and 44° N. (the north of Spain), and 8° or 9° S. lat. (Ascension and Loando). Whether genuine yellow fever does not prevail further south along both the western and the eastern coasts of Africa, it is at present not possible to determine. The fevers of Madagascar are, it has been stated, often attended with the characteristic symptoms of the disease; and this circumstance may lead us not unreasonably to expect the occasional occurrence of a pestilential outbreak. But it must be admitted that, as yet, no epidemic of what can be justly considered as yellow fever has ever been observed or recorded in any part,

[1] McWilliam in the Trans. of the Epidemiological Society.
[2] Army Reports for 1859.

island or mainland, of the Pacific Ocean, until we arrive at the western shores of the American continent. That the pestilence has, within the last fourteen or fifteen years, taken a wider range than it did before, is a fact of curious and instructive import. It has appeared, also, at higher elevations, and in cooler latitudes, than used to be assigned as limiting its career. But wherever it has been seen, it has manifested the same general attributes or properties in relation to the external agencies which affect its development and spread, and which influence its virulence and fatality. It usually manifests itself in summer or autumn; from July to November, in the northern hemispheres, is the season when it most prevails, and is most deadly. In this respect, it is like alvine fluxes and enteric fevers. Like them, too, its origin and malignancy are powerfully promoted by local causes of insalubrity and atmospheric pollution. Low-lying and foul foreshores of harbours, where the water is stagnant or nearly so, and the immediate neighbourhood of undrained, filthy wharves, &c., are the special seats of its early manifestations and most frequent recurrences. Hilly, dry, inland spots are comparatively exempt, unless where the natural advantages are counterbalanced by artificial sources of impurity, as has been the case with many military stations in the West Indies, &c., which abound with nuisances around and within them, and are, at the same time, made still more unhealthy by overcrowding and defective ventilation of the barracks. The troops have often been smitten when the civil population escaped. Overcrowding in the between-decks of steamships seems to be the principal cause of the extreme fatality of the disease in the navy. What in this respect is true of typhus, may with equal force be said of yellow fever. There is no such powerful adjuvant to the virulence of the poison, and to its power of propagation, as an unrenewed atmosphere, loaded with human exhalations.

Having now briefly sketched the recent geographical history of the Oriental and the Occidental pestilences, it is my wish to do the same in respect of the world-wide pestilence, epidemic cholera, since the great eruption of the disease in lower Bengal in 1817.

Art. III.

On a Case of Paralysis, with Pathological Investigations. By J. Russell Reynolds, M.D., Physician to University College Hospital; and J. Lockhart Clarke, F.R.S., &c.

History of the Case, with Autopsy.

by dr. reynolds.

D. L., aged fifty-three, a plasterer by trade for thirty-eight years, was admitted into University College Hospital on September 15th, 1863. His parents were both dead; he was a widower, and had four children alive and in good health.

When sixteen years of age he had a severe fall, and struck his left side, and from this he had "suffered ever since." At nineteen years of age he had "pleurisy of the left side;" at twenty-three he contracted gonorrhœa, but had never had syphilis; at twenty-six he received a severe blow on his head, while taking part in a fight, was knocked down, and remained "insensible for some time."

Nine months ago he was engaged in plastering a shaft in a wash-house, and was exposed alternately to strong currents of hot and cold air. He felt pain in the left side of his chest, was ill, and took to his bed. At this time there was nothing the matter with his limbs. After ten weeks he recovered, and resumed his work for a short time; but five months ago, while at his work, and without assignable cause, he suddenly felt weak and unable to go on. He again took to his bed, and has kept it almost ever since. Soon after taking to bed, but he cannot say how soon, the "sense of feeling" became much less in both his hands, and in the course of seven or eight weeks he found that he could not squeeze an object with the left; the attempt to do so gave him pain, and, indeed, any effort at movement of the left arm was painful. Ten weeks ago he "had a fit," which he states to have lasted for two hours and twenty minutes. He retained, throughout, his consciousness and sensibility, and the fit consisted of twitching movements of the left eye, arm, and more slightly of the left leg. Since this time he has had five or six fits, somewhat similar in character but of less duration, and in one at least of them he lost his consciousness. Each fit has been preceded by a sense of coldness at the back of the left hand. This lasted long enough before one of the attacks to enable him to lie down, as he feared that if he did not do so he should fall; the other seizures occurred while he was in bed.

On September 17th, he was thus described: D. L. complains of his head, chest, and arm, but most strongly of the latter. He says that it is cold and weak; and he carefully wraps it in old stockings, and covers it with the bedclothes; he looks at it as if it was something to be taken the greatest care of; and if told to move it, does so with the other hand most tenderly, and is particularly cautious that no one shall touch it but himself. Yet, if asked to move it without touching it with the other hand, he can do so; indeed, he can execute every movement of the whole extremity; but he performs them slowly, cautiously, and feebly; those of the shoulder-joint more readily than those of the elbow, of the elbow more freely than of the wrist, of the wrist more easily than of the fingers. The sense of touch is equal in the two hands, forearms, and arms; but the arm, he says, feels cold, "always cold," and if he does not keep it well wrapped up it begins to jerk, and the jerking is painful. If the arm is moved suddenly or roughly he feels great pain in it. There is no swelling of any joint; but the arm is notably thinner and more flaccid than the right, and it is certainly slightly warmer to the touch. The left pectoral muscle is thinner and more flabby than the right. The brachial, radial, and ulnar arteries are rigid, tortuous, and locomotive. There is highly marked arcus senilis. The muscles of the left arm and forearm are much more irritable when percussed than are those of the right side. There is no affection of the left leg; the tongue is protruded without deviation; the upper features are symmetrical, but the right angle of the mouth is higher, and the right nostril rounder than the left. The pupils are equal and small; articulation is perfect as a rule, but occasional clipping of words occurs, and the patient never separates his teeth in talking. His mind appears quite clear; his expression of countenance is easy; his use of words good, and his answers intelligent and to the point. There is a desire to pass water frequently, he is uneasy when more than six ounces have gathered in the bladder. The urine is of sp. gr. 1005, alkaline, free from albumen.

The patient suffers from constant cough, and from gnawing pain in the left side of the chest; the supra and infra-clavicular regions, left, are absolutely dull on percussion; the breath-sound is cavernous, with an occasional gurgling rhonchus, and there is distinct pectoriloquy. The second sound of the heart is rough and prolonged.

℞. Tinct. calumbæ, f℥j; infusi ejusdem, ℥iss.; misce, fiat haustus ter die sumendus, cum olei morrhuæ, ʒiij. To take daily, a mutton-chop and a pint and a half of beer.

Sept. 20th.—In the evening the patient had a fit, which lasted nearly a quarter of an hour. He felt its approach and lay down on his bed. When seen by my assistant, Mr. E. L. H. Fox, there were twitching movements of the left eyelid and arm; these gradually increased in severity, but the patient was able to ask for some cold water. He then lost consciousness, and the twitching extended to the right arm and to both legs. The mouth was drawn to the right side, the pupils were somewhat dilated, the pulse was imperceptible, there was no stertor. On recovering consciousness the heart beat violently, there was pain on the left side of the chest, and profuse perspiration over the whole body. No headache.

The urine remained alkaline until Sept. 26th, when it was found slightly acid, sp. gr. 1007, with excess of phosphates. On this day a fit, similar to that on the 20th, took place. The mouth was drawn first to the left, and afterwards to the right side. Both eyeballs were turned strongly to the left. At commencement of fit the face and neck were flushed, but soon became ashy pale, with a livid tint of the lips.

On Sept. 28th, there was headache on the right side, and the urine was again alkaline, sp. gr. 1007.

Oct. 3rd.—Complains of sickness after breakfast, and points to left mammary region as the seat of pain, or rather of a "sick, gnawing feeling." There is also tingling in the left foot, hand, and forearm; the arm is constantly kept wrapped in flannel, but the muscles feel a little firmer than formerly. Aspect generally has improved; patient is free from headache. Tongue is protruded without deviation.

Oct. 4th.—Headache at vertex.

Oct. 6th.—Tongue deviates at the tip to left side.

Oct. 17th.—Has fallen out of bed twice to-day, and on each of the last three mornings has had "a fainting fit." At times he seems scarcely to know what he is doing.

Oct. 20th.—Complains of pain in left arm.

Oct. 22nd.—Can move left arm only a few inches from the bed. Walks to the fireplace, but drags the left leg in doing so. Tongue deviates to left. Urine alkaline, sp. gr. 1010, no albumen.

Nov. 3rd.—Urine alkaline, phosphates in abundance.

Nov. 9th.—It has become necessary to move the patient to a private ward. He has been troublesome, noisy, mischievous, dirty in his habits, and a nuisance to the other patients. He appears weaker, and falls down often when he gets out of bed. Articulation is indistinct, he sleeps well, but is frequently trying to get out of bed. Appetite good; cough less troublesome. It is necessary to tie him down in bed, as he has fallen almost every time he has tried to get up.

Nov. 11th.—Patient thinner in the face, with a slight flush upon the cheeks. He answers questions quite sensibly, and says that he is in no pain, except in the left side of chest. Pulse 96, regular, soft. The left arm exhibits constant but slight jerking movements, principally effected by muscles of shoulders and upper arm. The fingers are extended, but quite flaccid. On extending elbow-joint fully, the jerking movements are increased, and they extend to the pronators and supinators of the hand. The limb feels soft, and falls heavily when raised. Movement by observer causes pain in the shoulder. Patient is unable to raise arm from abdomen, across which it is lying; his attempt to do so increases the jerking movement. The temperature of the two arms is equal. Tongue deviates constantly, but slightly to the left; the right angle of mouth is higher than natural; the features are otherwise symmetrical. Pupils small, equal, acting very feebly to the diffused light of room, but readily to that of candle. Says that he hears well, which he appears to do, with either ear; that he tastes his food correctly; that he feels a slight pinch of the skin quite as well on one arm as on the other. He moves the left leg quite well in bed, and feels a pinch there as well as on the right. He again says he has no pain in the head. Sometimes he uses the utensil when he passes water; sometimes he passes it into the bed. He does most absurd and disgusting things, such as washing his face in his beer, and then drinking it; and he has once tried to anoint himself with fæces. He sleeps much, but when awaked answers questions rationally and in a natural manner.

In this state he continued until November 22nd, when he was evidently sinking, having taken nothing but liquid food for several days. He sleeps almost constantly with eyes half closed, and mouth wide open; is very restless when awake; passes evacuations involuntarily; sees very obscurely; says "no" when asked if he knows who the clinical assistant is, but recognises his daughter, and calls her by name. Pulse 136, regular, full; no cough; does not appear to be in any pain; answers questions rationally when roused; has a large bed-sore over sacrum.

Without exhibiting any fresh symptom, but gradually becoming more comatose, he died on November 23rd.

Post-mortem Examination.—Rigor mortis is well marked in all the limbs except the left upper extremity, which is flaccid at shoulder, elbow, and fingers.

Measurements.

Circumference of middle of arm around belly of biceps	Right,	9 ins.	...	Left,	$7\frac{1}{4}$ ins.
,, forearm	,,	$8\frac{1}{2}$,,	...	,,	$7\frac{1}{4}$,,
,, thigh	,,	$12\frac{3}{4}$,,	...	,,	$12\frac{3}{4}$,,

Bones of the skull are pale and thin; diploe scarcely to be observed anteriorly; dura mater is pale, bloodless, and its large vessels empty; it separates with perfect facility from bones, and there is no adhesion between it and viscus. Arachnoïd and pia mater are opaque over the posterior and middle thirds of the upper exposed surface of the left hemisphere. There is also slight opacity over the middle third of the right hemisphere. Membranes are removed easily from the left side, leaving behind them, in sulci between convolutions, a small quantity of bloody serum; those on the right side are separated with some little difficulty, but without tearing subjacent cerebral tissue. The anterior, middle, and posterior lobes of the brain are quite free from adhesions inferiorly; when removed, between three and four fluid drachms of bloody serum are seen in the occipital fossæ. The basilar artery contains much atheromatous deposit in its walls, as also does the anterior cerebral artery on the left side, and the ophthalmic artery; whereas those on the right side are perfectly free. The deposit in the walls of the anterior cerebral artery does not extend into its primary branches.

In the middle of the right cerebral hemisphere, passing from the front backwards, but very close to its lateral surface, there is a large indurated mass, which separates so easily as to fall away from surrounding brain-substance, except anteriorly, where it is adherent. This measures $1\frac{3}{4}$ inch transversely by $1\frac{1}{2}$ inch antero-posteriorly. Its cut surface is curdy-looking, of yellowish-straw tint, presenting in its centre, which looks like white brain-matter, only one or two points and streaks of blood, and blood-vessels, but being in the main bloodless. Its external surface is translucent-looking, glistening, and vascular, resembling closely in appearance the grey matter of the brain. It has no connexion with the meninges; but its anterior surface is in close proximity to that portion of them lining the anterior cornu of the right lateral ventricle. The brain-tissue in the immediate neighbourhood of the tumour is readily washed away by a very gentle current of water; it is softened most completely near the descending right cornu, where it is partially diffluent, a feeble current of water removing some creamy-looking matter, and leaving behind a cribriform tissue. The fornix, especially its under surface, is soft and almost diffluent. The corpus callosum is in the same condition, especially its right half; the right optic thalamus is smaller than the left, and much softer to the touch, but it is not washed away by a gentle stream of water. The corpora striata appear equal, of normal size and consistence; the commissura mollis is present; the sixth nerve on the right side is thinner than its fellow. The anterior roots of the last two cervical nerves on the left side are reduced to less than $\frac{1}{20}$th of the size of those on the opposite side; there is no obvious difference between the nerve-trunks of the brachial plexuses on the two sides. There is nothing abnormal to be observed in the spinal column; the dura mater appears healthy; the cord is removed for examination by Mr. Lockhart Clarke.

The left lung is firmly adherent to ribs and spine; pleura is thickened to extent of $\frac{1}{4}$ in., and of cartilaginous firmness. The whole of the upper two-thirds of lung is found occupied by an enormous cavity of very irregular shape, and filled with grumous, cheesy, almost odourless pultaceous matter, of divers colours, yellow, red, and black. On clearing it away a ragged, irregular wall is presented of very variable colour, consistence, and appearance. The basis, and what appears the most characteristic portion of diseased structures, presents a striking resemblance to the external portion of the tumour discovered in the brain. In some portions the wall is "villous," the villi hanging in large, irregular masses into the cavity. A portion of this substance has grown out posteriorly into one of the larger bronchi, and this presents a villous appearance. Another portion has projected under the thickened pleura posteriorly; and this portion, on section, presents a most striking resemblance to that found in the brain, the centre being cheesy and soft; the circumference glistening, semitranslucent, pink, and of finely granular aspect. Similar nodules are found scattered throughout the upper lobe of this lung. Bronchial glands are enlarged and black, with some glistening white spots. The bronchial membrane is intensely injected; the lower lobe of the lung is free. The right lung is free from adhesions, congested, crepitant throughout; bronchial tubes are much congested, and filled with frothy serum. Bronchial glands enlarged, highly melanotic, softer than the left.

The left kidney presents on its surface a small yellow spot, hard to the touch, elevated above surface, in shape pyramidal, the base being external; in size equal to a small nut, denser than the kidney tissue, and pale throughout. Kidney otherwise healthy.

Right kidney presents similar spots on its surface, but they are of smaller size.

Examination of the Spinal Cord, etc., with Remarks.

BY MR. LOCKHART CLARKE.

The parts forwarded to me by Dr. Reynolds for examination consisted of the *pons Varolii*, the *medulla oblongata*, and the spinal cord, from the second cervical to the sixth dorsal nerves.

In the *pons* and *medulla oblongata* nothing remarkable was discovered except a faint, rank, and very peculiar odour, when incisions were made through the former. In the spinal cord, however, there were morbid appearances of various kinds, and lesions of structure that were sometimes numerous and extensive. At the level of the *second cervical* nerves the posterior white columns were considerably softened, and the degree of softening was greatest at their deeper parts between the posterior horns. In some sections the posterior commissure and inner edge of the *cervix* cornu of one or of either side were slightly injured in the same way. The remaining white columns and the rest of the grey substance were apparently healthy.

At the *third* cervical nerves, the posterior white columns were nearly in the same softened condition, but the posterior commissure and parts around the canal were more damaged than in the preceding sections.

At the *fourth* and *fifth* cervical nerves the posterior white columns were somewhat firmer, and the grey substance around the canal, as well as in the two lateral halves, although somewhat congested, was otherwise nearly healthy.

At the sixth cervical nerves, the posterior columns were still much softened, particularly at their deeper parts between the cornua; and the transverse commissure on which they rest, with the cervix cornu on the right side, were soft and somewhat broken. The anterior cornua of the grey substance were both smaller than natural, and a little altered in shape.

At the *seventh* cervical nerves (fig. 1), the posterior white columns,

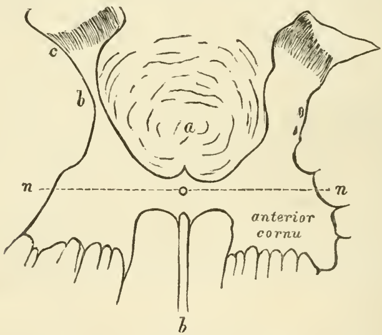


Fig. 1.

particularly their deep strata (*a*) between the cornua, were softer than above. On the left side, the *cervix* cornu (*b*), where it joins the *caput* cornu (*c*), was much narrower than usual, and in some sections was nearly destroyed. At the *lower* roots of these nerves, the deeper and softer parts (*a*) of the posterior columns began to undergo solution. This destructive process showed itself at first in the form of small, irregular areas of fluidity. On descending the cord, these areas rapidly coalesced, to form for the most part a single but irregular sac, which extended sideways and backward, until the posterior commissure and the greater part of the cervix cornu on each side were involved in the destruction. Fig. 2 represents a transverse section of the grey substance between the seventh and eighth cervical nerves. The whole of the blank space *d*, *d*, *d*, *d*, shows the exact form, size, and relative position of the fluid area, resulting from the solution of the posterior commissure, the lateral parts of the grey substance, and

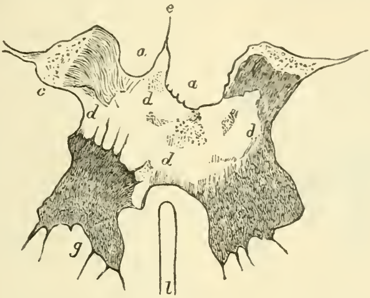


Fig. 2.

the lower strata of the posterior columns (*a a*), so that the distance between the posterior and the anterior median fissure (*e*) is very much increased. In this fluid space might be seen some half-dissolved masses of both white and grey substance, various in shape and size, and either isolated completely, or only partially severed from the tissue to which they belonged; broken nerve-fibres, surrounded by granules, to which their neighbours had been already reduced; bloodvessels eroded in part, or partly reduced to the same granular condition; and fibres of various kinds, stretching quite across the space, or sundered in the middle, and projecting from its opposite sides. Scarcely anything but the *extremities* of the posterior cornua had escaped solution; and

Fig.3.

although the anterior grey substance was apparently healthy, the connexion between its opposite halves was more or less interrupted by partial destruction of the anterior commissure.

In fig. 3 is seen the exact appearance of a transverse section of the grey substance a little lower down, on a level with the *upper* roots of the *eighth* cervical nerves; and fig. 4 represents a similar section on a level with the *middle* roots of the same nerves. In the latter we find a remarkable want of symmetry between the opposite lateral halves, in consequence partly of the large size of the fluid area (*e*) on the left side. On the right side, at *f*, the sac is partially divided into separate compartments by remnants of the half-dissolved tissue, and has a somewhat honeycomb structure.

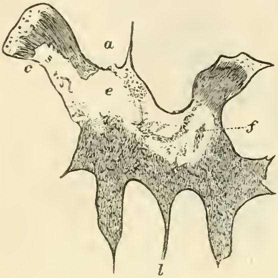


Fig. 4.

The morbid appearances were of a similar kind and size along nearly all the rest of that portion of the cord which gives origin to these nerves (the eighth cervical), but began to decrease in extent opposite their *lowest* roots, and continued to do so through the whole of the *first* dorsal. Here, however, was the commencement of another kind of lesion, together with a remarkable displacement and alteration in form of the entire grey substance of the left side. Fig. 5 represents

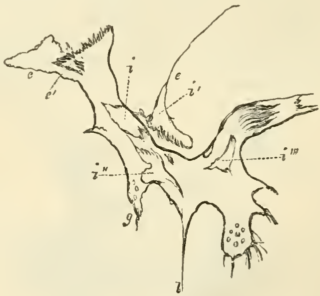


Fig. 5.

a transverse section of the grey substance at the *upper* roots of the *first* dorsal nerve. The lateral half on the left side is seen to be altered in shape, and drawn obliquely backwards—a displacement which was shown to commence at the eighth cervical nerves (fig. 4).

The anterior cornu (g) is actually much smaller on this side than on the other, but this diminution in size must not be mistaken for atrophy—it arises simply from the drawing backward of a great part of its substance into the base of the posterior cornu, and to the outer side of the canal. This explanation will be better understood by examining fig. 6, which represents a similar section a few lines lower down. Here we see that the part (g), just behind its group of cells, has, on the left side, been pushed, or rather drawn backward, carrying with it the posterior vesicular column (h), and increasing in a corresponding proportion the cervix cornu (m), as well as the parts at the side of the canal (k). And now with regard to the cause of this curious displacement. On examining the surface of the cord at this spot, the lateral part of the left posterior column, or that part next the posterior lateral fissure, presented a softened and almost pulpy mass, in which a kind of longitudinal trench or furrow had been hollowed out, as if some part had been carried away by incision. No incision, however, had been made on removing the cord from the body. The bottom of this trench, or furrow, reached down to the dilated extremity of the posterior horn, or the *caput* cornu (c), which was swollen and extremely vascular, but only partially destroyed. At the section corresponding to fig. 6, almost the whole of the *caput* cornu was gone; but this was probably carried away accidentally with that portion of the softened column which lay immediately behind it, and left the furrow in question. However this may be, it is quite certain that the *caput* cornu was very vascular, and very much dilated—a condition which is common in inflammation of both the white and grey substance, but particularly, I think, of the latter. The curious displacement and alteration in shape of the whole of the grey substance on the left side, at this portion of the cord, seem to admit of the following explanation: First, there was inflammation of the left posterior white column involving, perhaps only subsequently, the *caput* cornu; by degrees a breach was opened in the investing pia-mater, and through this there gradually escaped upon the surface a hernial protrusion of the swollen and softened white substance, which was followed in the same direction by the subjacent grey substance of that side. On removing the cord from the body, or by some other accident, the hernial protrusion, with the parts immediately beneath it, was probably brushed away, or indented in the middle. My reason for adopting this explanation is, that in some cases in which I have met with similar displacements of the grey substance, they have been connected with hernial protrusions of the white substance on the surface

Fig. 6.

of the cord, and had apparently been the result of a very gradual process, and not of a sudden eruption through an *accidental* breach in the investing pia-mater.

At the *second* dorsal nerves the grey substance resumed its normal shape, but was a little smaller and more slender than usual, while the posterior commissure and posterior white columns were somewhat soft.

On a level with the third, fourth, and fifth dorsal nerves, the cord, throughout its entire thickness, was apparently in nearly a healthy condition, a slight congestion of some of the sections being the only abnormal appearance. At the sixth dorsal nerves, however, it was again extensively diseased. The grey substance was more or less altered in shape, and unsymmetrical. The anterior cornu on the right side was variously injured in different sections, and the blood-vessel which supplies it, and enters through the anterior median fissure, was very much congested; while the anterior white column on either side was soft and likewise congested. The posterior white columns were scarcely affected, but some blood was extravasated from a vessel at the side of the median fissure. The posterior cornua were in some sections twisted or drawn from their natural position, and in others a considerable extravasion of blood was found on the right side, occupying nearly the whole of the *tractus intermedio-laterales.*

Remarks.—In relation to the physiology of the spinal cord, the case before us presents some points of interest upon which it may be well to offer a few comments; but in doing so we must bear in mind that the lesions of structure are very complicated, and occur in both the brain and spinal cord, to each of which similar symptoms may often be referred as their source. In seeking, therefore, in the morbid anatomy, for an explanation of the symptoms, or in taking the co-existence of certain symptoms with certain lesions of structure as an indication of the functions of particular parts of the cord, we must be careful not to overstrain the facts, and attribute to disease of this centre alone results which may be due, partly or entirely, to disease of the brain.

First, then, with regard to the paralysis of motion. This was limited to the *left arm*, and was never complete. To account for it, sufficient alteration of structure was found in different parts of the brain. There was found, in the middle of the *right* cerebral hemisphere, a large indurated mass surrounded by softened brain-substance, which, at the descending cornu of the lateral ventricle, was nearly diffluent. The fornix, and the corpus callosum, especially on the *right* side, were in the same softened state. The *right* optic thalamus was smaller than the left, and much softer. Now, with apparently less cerebral damage than this, we sometimes find paralysis not only of the opposite arm, but of the whole opposite side. It is difficult, therefore, to determine how far the paralysis of motion in the left arm was dependent on any of the lesions of structure that were found in the spinal cord. We have already seen that the grey substance of the cord which gives origin to the lower *three* out of the *five* pairs of nerves that go to form the brachial plexus was very much diseased. At the lower roots of the *seventh* cervical nerve a considerable portion of the grey substance on each side and around the canal was partially reduced to a fluid state; and from thence to the *lowest* roots of the *eighth* cervical, the whole of this portion of the grey substance had undergone almost complete solution (*see* figs. 2, 3, and 4). Now, if this extensive lesion had been limited to one side, it might have been considered as at least a *possible* cause of the paralysis of the left arm, by destroying fibres which are concerned in transmitting the impulse of volition; but since the right arm and right leg were unaffected, while the lesion was as great on the right side as on the left, it is fair to conclude that this portion, at least, of the grey substance is not entrusted with the transmission of voluntary impulses.

But the condition of the grey substance at the eighth cervical and first dorsal nerves was such as to account in some measure for the loss of power in the left arm; for in fig. 4 we see that the deep portion of the anterior cornu is partially destroyed on the left side, and, as in fig. 5 *i* and fig. 6 *i*, it was much displaced, somewhat atrophied, and encroached upon by areas of semi-fluid granular destruction; while the anterior roots of the nerves on the same side were shrunk to a considerable extent.

With regard to sensation in the left arm, we are told that, so far from being diminished, it was actually increased—that there was painful hyperæsthesia, at least, of the muscles: every movement of the arm was productive of great pain. Neither was there the slightest diminution of sensibility in the trunk or lower extremities. It appears, then, that the central parts of the grey substance, which in this case were destroyed on both sides, as represented in figs. 2, 3, and 4, cannot be concerned in transmitting sensitive impressions. The mystery is that, since almost an equal portion of the central grey substance was destroyed on the *right* side, there was no painful hyperæthesia in the *right arm;* for, although this part of the grey substance would not appear to be concerned in directly transmitting sensitive impressions in a longitudinal direction, still the surrounding parts that *are* thus concerned might have been kept in a state of morbid irritation by their proximity to the seat of disease. The difficulty may probably be explained by the fact that on the *left* side, as represented in figs. 5 and 6, the *caput* cornu, or dilated extremity of the posterior horn, and the posterior columns, traversed by the posterior roots, appeared to have been inflamed and partially destroyed, while those on the right side were apparently healthy.

In this case, then, morbid anatomy is opposed to the conclusions of Brown-Séquard, with regard to the transmission of sensitive impressions. According to him, this office is performed *chiefly* by the *central* grey matter. "I call central grey matter," he says, "the lateral masses, the bases of the anterior and posterior horns, and all the substance around the central canal."[1] But these are precisely the parts that we find almost wholly destroyed in the case before us. He

[1] Lectures on Central Nervous System, p. 23.

allows, however, that sensitive impressions are transmitted in part by the extremities of the posterior horns, and probably by those columns of longitudinal fibres which were first pointed out by myself in that part of the grey substance.[1] Possibly it might be objected by some that the remnants of the central grey substance surrounding the fluid space were sufficient to convey sensitive impressions, since, according to the experiments of Van Deen and Schiff, exceedingly small portions of the grey substance are capable of so doing; but then in such cases the sensations are duller, and felt only some time after impressions are made, just in proportion to the smallness of the substance left.[2]

It is maintained by Schiff, Budge, and Chauveau, that *every part* of the grey substance is capable of transmitting sensitive impressions. Schiff divided in a cat all the posterior and central grey substance of the cord, with or without injury to the lateral columns, leaving only the anterior grey horn: the parts of the body behind the section were still sensitive, and there was even hyperæsthesia. Nay more, when the *base* of the anterior horn was also divided in the cat and kitten, the parts behind were so sensitive that a pinch of the tail or toe excited in the fore part of the body violent efforts to escape.[3] On the other hand, after removing the posterior white columns without injuring the posterior *horns*, and then dividing *all* the *anterior half* of the cord, it was found that sensation in the parts behind was at first lost, but after a time was not only restored, but stronger than normal.[4] By other experiments it was likewise found that all the CENTRAL grey matter can conduct sensitive impressions.[5]

[1] Lectures on Central Nervous System, p. 24.

[2] This fact, which was first, I believe, noticed by Cruveilhier pathologically, has been by some regarded as doubtful, but is supported by the experiments of Schiff (Lehrbuch, p. 125). Cruveilhier (Anatomie Pathologique, xxxviii., p. 9) observed that in a case of paralysis of motion, the patient was not conscious of irritation of the paralysed limb until a period of from fifteen to thirty seconds had elapsed. This statement is quite in accordance with my own experience. In a case of paraplegia which recently came under my observation, and of which the particulars, including the morbid anatomy, will be published in due time, I tested the susceptibility to sensitive impressions of different kinds. The *left* foot and leg, which were the first to be paralysed, were entirely deprived of common sensation, but on pricking the sole of the foot near the heel, there were some movements of the toes. The *right* foot, which became quite paralysed as to voluntary motion shortly after the left, retained common sensation, but only in a slight degree. Rubbing the instep with the hand, however hard, was felt only as the *slightest brush.* Indenting the same part with the end of the finger and the nail, was felt only as the *slightest contact or touch;* and pressing on the skin with the sharp point of an instrument was felt simply as a *weight or pressure.* Although, however, the *left* leg was totally deprived of common sensation, it was susceptible of impressions of another kind. When a spoon dipped in boiling water was applied with its convex surface to the *instep*, a slight sensation of heat was felt, *but only after the lapse of about twelve or fourteen seconds,* although the application raised vesications. In no other part of the foot was the heat felt. When the hot spoon was applied to the instep of the right foot, which retained some common sensation, it felt *simply warm, but only after the lapse of about ten or twelve seconds.* When, however, the spoon was applied to the *sole* of the same foot, the sensation of heat was *painful*, and felt *sooner* after the application. With regard to the *left* foot, there seemed to be some uncertainty in the patient's mind as to the *locality* of the impression, when he did not see it made; but after a little attention and consideration, he was generally correct in his answers.

[3] Lehrbuch der Physiologie des Menschen, p. 243. [4] Ibid. p. 244. [5] Ibid.

With regard to the conduction of voluntary impulses by the grey substance, there is an equal discrepancy between the results of different experimentalists, especially of Schiff and Brown-Séquard.

According to Brown-Séquard, voluntary motor impulses are transmitted in the *dorsal region* chiefly by the anterior columns and anterior half of the grey substance; while in the *upper part of the cervical region*, near the medulla oblongata, most of the conductors of the orders of the will to muscles are in the *lateral* columns, and in the grey matter between these and the anterior columns.[1] Schiff, on the other hand, maintains that *all parts* of the grey substance are capable of transmitting voluntary impulses. After dividing in a *frog* the whole *anterior half* of both the white and grey substance, avoiding the posterior part of the lateral columns, Schiff saw very extensive and vigorous voluntary movements of the hind legs. When the same parts of the cord were divided in the *cat*, as far back as the level of the spinal canal (as indicated by the transverse dotted line, *n*, in fig. 1), after some time, Schiff saw the animal walk about so regularly, that one would not have suspected that the spinal cord had been at all injured![2] After dividing the posterior part of the lateral column, by which operation some extent of the grey substance was damaged, motion remained in the hind feet, although weaker than before. The same results were obtained by operating on large dogs. On carrying the section further back, so that only a thin layer of the posterior grey substance was left, Schiff saw a more or less extensive, but feeble voluntary movement of different points of the hind feet, which, however, were no longer able to support the body. The movements were constantly seen in the *frog*, but only in fortunate cases among *mammals*. In frogs, Schiff produced in the toes voluntary movements, which increased on irritating the fore feet; and these movements were seen even in cases in which the layer of grey substance left to connect the anterior with the posterior part of the body was so small that *it could not be seen by the naked eye!*

From these experiments Schiff concludes that, as in the case of the transmission of sensitive impressions, so in the case of the conduction of voluntary impulses, there is no difference whatever between the anterior and the posterior grey substance. The antero-lateral columns he regards as motor, and the lateral columns as concerned in the respiratory movements. He denies to the white columns any participation whatever in the transmission of sensitive impressions. On the other hand, Brown-Séquard, while admitting that the grey substance is the chief conductor of these impressions, believes, as did Monat, Calmeil, Schoeps, and Budge, that this office is shared to a certain extent by the anterior *white* columns. He asserts that the fibres so employed form the inner surface of these columns in contact with the grey matter.[3] Schiff concludes, from his experiments, that the *posterior* white columns are the independent conductors of *tactile* im-

[1] Lectures on the Central Nervous System, p. 47.
[2] Lehrbuch der Physiologie des Menschen, p. 282.
[3] Lectures, pp. 22–3, and Proc. Royal Soc., No. 27, 1857, pp. 593–4.

pressions, and that each column contains the tactile nerve-elements of the corresponding half of the body.[1] Brown-Séquard positively denies that they have any such office.

Such are the recent opinions on some of the most important points in the physiology of the spinal cord. I shall take another opportunity of showing how far they are in accordance with the results of my own researches into the minute anatomy of the cord and medulla oblongata; and shall only stop to observe that I have reasons for withholding my assent to the opinion that the grey matter is the conductor of sensitive impressions and voluntary impulses, *in the sense in which it is understood by the above-mentioned physiologists.* I do not believe, for example, that sensitive impressions are conveyed from the anterior or posterior extremities to the brain, and that voluntary impulses are transmitted in an opposite direction to the same parts, *exclusively* and *uninterruptedly* by the *grey substance;* but that this substance is the conductor of any given impression only for a certain but variable distance. The experiments which I have just related as bearing upon this question I do not receive as conclusive, and therefore as opposed to the opinion which I hold; for to prove that the grey substance is the sole, uninterrupted conductor of impressions from the brain, for instance, to the dorsal or lumbar region, the white columns should be completely divided in *many places* between these parts. The absolutely contradictory results arrived at by experimentalists of equal practice and skill justify us in receiving with great caution the conclusions drawn from this mode of investigation, and should induce us to rely more extensively on the resources of morbid anatomy as a method of physiological research. But to render this method properly available for the purpose, it must be employed in a way very different from that in which it has hitherto been employed, and pursued with much greater accuracy and precision. If there be reason to suspect that a nervous centre is diseased, it will not be sufficient to trust to the naked eye as a test of its real condition, however natural it may be in consistence and general aspect. My own recent pathological investigations have shown that a spinal cord which appears healthy, or nearly healthy, to the unassisted senses, may be studded with a number of lesional points which are too minute to be detected by the naked eye.[2] Nor will it suffice to ascertain simply whether the lesion is in the anterior, the posterior, or the middle grey substance, or in any one of the white columns. It will be necessary to ascertain with the greatest accuracy, and delineate with photographic fidelity, the *exact form, relative size,* and *locality* of the lesion in every section. Such exactness and precision employed in the morbid anatomy will of course demand a more searching and complete scrutiny of the symptoms and general condition of the patient during life; and might, perhaps, by some be considered as scarcely worth the trouble which it entails. I venture, however, to assert that this method, provided it be steadily and

[1] Lehrbuch der Physiologie, pp. 251–6.

[2] See Beale's Archives of Medicine, No. 9, et seq., as well as several recent numbers of this Journal.

perseveringly pursued in a number and variety of cases, will not only lead to important results in regard to diagnosis, but will probably reveal physiological truths which no vivisectional experiment can possibly reach.

ART. IV.

Experimental Inquiries into Certain Wounds of the Skull. By W. F. TEEVAN, B.A., F.R.C.S., Surgeon to the West London Hospital, &c.

WHEN a foreign body penetrates the skull, externally, the inner table will invariably be found more injured than the outer; and, as nearly all violence to the skull is applied from without, the above fact has been the cause of the establishment of an imperative rule in operative surgery. Now, as this rule was not determined without much discussion, and, as the remedy seemed so severely disproportionate to the apparent amount of damage, it can scarcely be wondered at that, at different times, surgeons should have inquired why it was that so trifling an external injury should be attended with such unseen internal destruction of bone, as to necessitate the performance of a usually fatal operation. To the military aod civil surgeon all wounds of the head are necessarily interesting, but to the latter they often possess an additional interest from their importance, forensically.

The following results given, are those of a series of experiments made on the skull, with different instruments, to determine, firstly, what generally are the comparative varying forms of the apertures of entry and exit; and, secondly, to inquire into the causation of a fact ascertained in the course of experiment—the always relatively greater size of the aperture of exit.

The experiments, 125 in number, were made in the dead-house of Westminster Hospital, on the skulls of persons ranging in age from 16 years to 60 years, within one month after their deaths. The instruments used were spherical bullets, conical bullets, pickaxes, crowbars, nails, and bricks.

In giving the results of such inquiries, it is perhaps better to reverse the process of elucidation employed to obtain facts and the deductions to be made from them. When a foreign body passes completely through any part of the skull—it matters not what the direction may be—the aperture of exit is always larger than the aperture of entry. It is here necessary to remark that, in order to gain the same results on the dead body that we should on the living, it is requisite to place the head in the same conditions as during life, when it is maintained temporarily fixed in varying positions by the contractility of the muscles; whereas, so soon as the rigor mortis has passed away, this force no longer exists, and the head dangles about like a flail when even very slight force is applied to it. Hence, if a dead man's skull be fired at, a very much larger wound will be made than if a similar amount of force were applied during life. The reason why such should be the case will hereafter be explained. It must also be borne in mind that when the living body is struck, the muscles of the part are always, instantaneously, involuntarily, contracted, thus still more increasing the difference between an ante-mortem and a post-mortem wound. To arrive, therefore, at the same facts as would be and are seen during life, it is necessary that the head be fixed.

The number of gunshot experiments made was ninety. Spherical bullets were used in twenty-three instances, flat-headed bullets in eleven cases, and conical bullets in the rest. If a bullet be fired, with a full charge of powder, close, and at right angles, to the part to be struck, a wound is produced which for practical purposes may usefully be called a typical wound; and it will render the descriptions of all other wounds presenting different appearances more easily understood if they be regarded as wounds altered from the typical wound by some modifying condition or fact.

Now, if a shot be fired at the outside of a skull under the conditions already laid down, it will be found that the aperture of entry in the external table is cleanly cut, and of exactly the same shape and size as the circumference of the bullet, the opening merely sufficing to admit the bullet, and looking very much as if it had been made by a trephine. There is never any splintering or fissuring about the edges. If the aperture of exit in the internal plate be examined, it will be found considerably larger than the aperture of entry; its circumference will generally be irregular, though rarely having splinters attached to or fissures radiating from its edge. The average diameter of the aperture of exit exceeds that of the aperture of entry by about one-third. The average irregularity in the aperture of entry seldom equals a line, whereas the irregularity in the aperture of exit generally varies from one-eighth of an inch to half an inch.

The size and shape of the aperture of entry made by a shot fired under the conditions already laid down never vary, whether the skull be thick or thin, hard or comparatively soft; not so with the aperture of exit, which attains its maximum size and irregularity in thick or hard skulls, and its minimum size and irregularity in soft or thin skulls.

If a head be decapitated and then fixed, and a shot be fired through the foramen magnum into the skull, the above descriptions will equally apply and be found to be true, if instead of aperture of entry in the external table we read aperture of entry in the internal table, and if instead of aperture of exit in the internal table we substitute aperture of exit in the external plate—thus clearly proving that the aperture of exit of a bullet is always larger than that of its entry. In no instance was there a single exception to this rule, neither have I been able to find one in the specimens in the different museums.

Spherical bullets fired from the smooth-bore arm produced much larger apertures of exit than conical bullets fired from the modern revolver; but the sum total of all the damage that can be done with the latter is very much greater than with the former, for it will traverse a greater amount of structure, and thus rarely lodges in the skull. The aperture of entry of a spherical bullet is generally circular; whereas that of a conical bullet is often oval.

The round bullet fired from the old firearm would seem to be retarded in its velocity according as whether the integuments of the skull, and the brain and its membranes, were present or not; but these structures seem to have no material influence in lowering the highest velocity of a conical bullet fired from a revolver. In compound gunshot wounds the aperture in the scalp is generally smaller than the aperture in the bone, and the eversion or inversion of its edges will be determined by the direction in which the shot is fired, whether from within or from without.

That bullet whose velocity can be reduced to the lowest compatible with its penetrating the skull, will produce the greatest amount of damage. Hence if the distance be gradually increased, or the amount of the charge of powder be gradually decreased, a correspondingly increased amount of damage will be produced. Bullets going at low velocities generally make apertures many times their own size, irregular in shape, with fissures radiating from, and fragments of bone adherent to, their edges. They have also a great tendency to present depressed fractures, consisting of three or four triangular pieces of bone driven in at their apices, but still usually adherent more or less, by their bases, to the skull; in fact, they produce very similar wounds to those that are made by a hammer whose striking surface is about the size of a shilling; and it is in these cases that the dura mater so often protects the brain, and entirely prevents the fragments being driven into that organ. It is remarkable what a slight resistance will often stop a nearly spent bullet. Three times the skull was struck obliquely with the old bullet, and in each case it glanced off, merely wounding the scalp. Eight times the skull was hit with the conical bullet slantingly, and in one instance only it failed to penetrate. When the bullet strikes in the above-mentioned manner, the wounds are very much greater than when the ball hits at right angles, for there is a tendency for the bullet to be cut in two by the sharp edge of the bone, or to be otherwise altered in shape, thus producing more laceration of structure. In the above seven instances in which the skull was perforated at an acute angle by a conical bullet, the aperture of exit was in every case larger than the aperture of entry.

In eleven instances the skull was penetrated at right angles with flat-headed bullets, with a full charge of powder. They produced the cleanest cut apertures I have seen; the difference between the openings being less than in any other experiments. All the above results were found to ensue equally whether the shots were fired from the outside or inside of the skull.

If a nail, pickaxe, or any metal rod tapering to a point be driven into the skull, either from within or from without, the aperture of entry will be found cleanly cut and only sufficiently large to allow the instrument to pass, whereas the aperture of exit is the largest, in proportion to the aperture of entry, that can possibly be created by any penetrating force; its circumference is very irregular, and sharp triangular spiculæ of bone are generally found detached, some completely, others still adherent by one end to the aperture. The reason why, in this variety of fracture, termed *punctured*, there is so little apparent injury at the aperture of entry, and such comparatively great destruction at the aperture of exit is, that the instrument acts not only as a penetrating body but also as a wedge, thereby giving rise to vibrations which destroy to a great extent the cohesion of the atoms of bone around the path traversed, and thus a greater separation of particles ensues.

The skull may be often stuck with a brick or hammer with a considerable amount of force, and yet no fracture occur; and extensive comminuted depressed fracture may be produced by either of the above two instruments without any injury whatever to the scalp beyond a bruise. The apertures of such fracture are always very large, with irregular edges, and have generally triangular pieces of bone adherent by their bases to the wound, their apices being depressed, either inwards or outwards, according to the direction of the force. When the great size of the openings is considered, it will be seen what little difference there is between them, the diameter of the aperture of exit not exceeding that of entry by more than half an inch.

All that has hitherto been related applies to bodies which penetrated the skull either from within or from without. When the instrument which strikes the skull does not itself pass through the bone, then occasionally modified results ensue. For instance, when a person is thrown out of a carriage and the head strikes the ground, a portion of the skull is often driven inwards in a cone-shaped manner, and it will sometimes be found that the line of fracture in the external plate is much more extensive than the corresponding line of fracture in the internal table; this is easily understood, if it be remembered that the body which the head struck against did not itself pass into the skull, but merely depressed, or drove in a portion of bone. This case therefore is one of non-passage into the skull of the fracturing body, and does not come under the proposition I have laid down. It was related to me that a case occurred in which the aperture of entry was actually larger than the aperture of exit. I stated that such a fact was a physical impossibility in all cases where complete passage of the instrument took place; and it was then explained that the weapon, a tapering metal one, was impacted in the wound. It will thus be seen that this was a case of incomplete passage, and that the diameter of that part of the instrument in the aperture of entry exceeded the diameter of that part which had progressed further, and in all probability the skull was soft and porous. I have never seen a similar wound in any museum specimens, nor have I been able to produce one. The use of the word aperture of *exit*, in all such cases, is incorrect, as the instrument never made its exit.

It occasionally happens that there is an aperture of entry only, the foreign body, generally pointed, perforating one table and then sinking into the diploe. Five times I produced depressed fracture of the external table without any injury to the internal table, by striking the skull externally with a tapering crowbar, and three times I made depressed fracture of the internal table only, without any injury to the external table, by striking the inside of the skull with the same instrument.

Although displacement of bone inwards constantly occurs when the blow is from without, yet displacement outwards may also occasionally happen. However, it can only result when the penetrating body acts as a lever; for instance, a bar of iron may penetrate the skull, and then by its own weight tilt up a portion of bone; in fact, depressing one margin of the aperture, and elevating the opposite margin. When a man falls head-foremost on to the spike of a railing, it sometimes ensues that, the head being fixed, the body describes part of a circle, and thus the spike acts, passively, as a lever, and elevates a portion of bone contiguous to the aperture.

The above experiments, therefore, conclusively prove that when a foreign body passes completely through any part of the skull, it matters not what the direction may be, the aperture of exit is always larger than the aperture of entry, and they, moreover, show that the supposed greater brittleness of the internal table has nothing whatever to do with causing an aperture of exit in that plate to be larger than an aperture of entry in the external table.

Independently of any surgical interest the above facts may have, they are of great importance forensically, inasmuch as they enable us to state precisely, in nearly every case, what were the direction and nature of the fracturing body; and I will show that in certain cases we can diagnose simply by reference to the bone only, whether the wound was made before or after death.

I now proceed to inquire into the causation of the comparatively greater size of the aperture of exit.

If the American, British, French, and German surgical works be examined, it will be found they all state, that, when a foreign body penetrates the skull from without, the inner table is more injured than the outer one, and they assign as the cause one or other of the following reasons:

1. Because the internal table is more brittle than the other.

2. Because the internal table is not supported, and therefore that it suffers more than the external table which it supports.

3. Because the penetrating body loses part of its momentum in passing through the proximal plate and diploe, and, therefore, as it strikes the distal table with diminished power it inflicts greater injury on it.

The following experiments which I made will show that the cause is not to be found in any of the explanations given, but is to be sought for in an, as yet, unnoticed fact. When it is considered that nearly every foreign body which penetrates the vault of the skull does so from without, and that, as the result of this, the internal table is certainly damaged more than the external one, it will at once be seen nothing was more likely than that surgeons observing two bodies struck by the same power, and one always suffering to a greater extent than the other, should also come to the conclusion that it was the more brittle of the two. No one appears to have ever thought of reversing the conditions to see if like results followed. Professor Erichsen was, I believe, the first to show, in the earliest edition of his work published in 1853, both clinically and experimentally, that, if the direction of the force be from within outwards, the aperture of exit in the external table will be larger than the aperture of entry in the internal table, and gave as the reason of such fact the loss of momentum experienced by the penetrating body in passing through the proximal table and diploe, causing it to strike the distal table with diminished power, and thus inflicting a larger wound.

Professor H. Meyer, in an article published at p. 85 of the second volume of Langenbeck's 'Archiv für Klinische Chirurgie,' for 1862, assigns two reasons for the greater damage done to the inner table when a foreign body penetrates the skull from without: firstly, the loss of momentum; and, secondly, that as the skull is composed of two concentric hollow spheres, the inner one has necessarily a less diameter than the outer one, and that, therefore, a segment from the outer table must be flatter than a segment from the inner table; consequently, as the result of this, when both tables are struck the inner one suffers greater injury than the outer one, as its segment undergoes a greater change of form than the external one. Had Professor Meyer reversed the conditions of his experiments he would never have given the second reason.

I now lay down and proceed to establish the following proposition: *The aperture of entry is caused by the penetrating body only, whilst the aperture of exit is larger than the aperture of entry, inasmuch as it is made by the penetrating instrument plus the fragments of bone driven out of the proximal table and diploe.*

When a bullet strikes the external plate from without it is the only body which makes and passes through the aperture of entry in that table; whereas the bullet and the pieces of bone which it cuts out of the external table and diploe are all driven in upon the internal table, fracture it, and finally pass through it.

Fig. 1 is a horizontal section of the skull made through the plane of the gunshot holes, and it will explain the following experiment: If a bullet be fired with a full charge of powder from a revolver close, and at right angles, to the external and lower part of the right parietal bone, A, it will pass through that bone, traverse the brain and its membranes, and finally emerge from the head at a corresponding point in the left parietal bone, D. There are, therefore, four openings in the skull, the apertures of entry, A, and of exit, B, in the right parietal bone, and the apertures of entry, C, and of exit, D, in the left parietal bone.

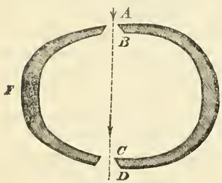


Fig. 1.

By some it would be stated that the aperture of exit, B, in the right parietal bone, is larger than the aperture of entry, A, in the same bone, because the bullet had lost some of its momentum in passing through the external table and diploe; and therefore, that as it strikes the internal plate with diminished power, it makes a larger opening. Now, if this explanation were true, then, *à fortiori*, the aperture of entry, C, in the left parietal bone, will be larger than the aperture of exit, B, in the right parietal. But what are the actual facts of the case as seen in the experiment? Why, the aperture of entry in the left parietal bone, although made by the same bullet, is actually smaller than the aperture at B; not only is it smaller, but it is clean cut, and regular. This, therefore, conclusively proves that one supposed cause, loss of momentum, can have nothing whatever to do with causing the aperture at B to be larger than that at A.

It is manifest, also, that the greater size of the aperture B, in the internal plate, is not caused by its greater brittleness, for it is seen that when the bullet crossed over to the other side it made a small clean-cut hole, C, in the internal plate, resembling that in the external plate, A.

It may be stated that B is always larger than A, that D is always larger than C, that C is always smaller than B; sometimes C is the same size as A, now and then a little larger than it.

Now, why is B larger than A, and C smaller than B? When the bullet cuts out the pieces of bone from the external table, A, and the diploe, it not only drives them forward, but it also tends to separate them, and cause them to exercise lateral pressure on all the bone contiguous to their paths, for as the *vis viva* of the bullet is very much greater than the *vis viva* of each of the fragments, it must follow that the bullet, in its endeavour to outstrip the fragments, not only presses them forwards, but also pushes them to either side; and thus it is that the inner table being struck by a disc composed of fragments of bone whose surface is larger than that of the bullet, has a larger hole made in it than that in the external table which was struck by the bullet only. C is smaller than B because it is made by the bullet only. This is how it is that the aperture of entry in the left parietal bone is smaller than the aperture of exit in the right parietal, for the fragments of the external table and diploe of that bone make the aperture of exit in the internal table larger than the aperture of entry; but they have no influence whatever on the second aperture of entry in the left parietal bone. The smaller the hole the bullet makes in the proximal table the larger, comparatively, will be the aperture in the distal plate, for the narrower the path the bullet makes for itself the greater pressure it will exercise on all before it. This is how it is that there is but little relative difference between the openings of the wound made by a bullet whose velocity is low, although that wound may be very large; in fact, it will generally be found that the larger the wound the less difference in size between its apertures. The experiment above related was repeated seven times; and in order to obtain the results described it is necessary that the head be fixed. that the skull should be perforated at right angles by the same bullet at two points where the bones are exactly the same as regards relative thickness, position, &c., and also that the bullet should not alter in shape in passing through the first side, for should it become flattened the conditions are at once altered; and hence the second side being struck by what is now an entirely different weapon as regards shape, we cannot draw any correct inference from such results. The use of iron bullets almost entirely prevents the above fallacy from taking place. The experiment can be very well exemplified on two well-planed planks of dense wood, each about one inch thick (fig. 2). If one plank be fixed a few inches behind the other, and a shot fired through both of them, it will be found that the aperture of entry, M, in the first plank, is small and regular, whereas the aperture of exit, N, in the same plank, is very much larger and ragged.

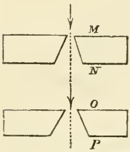


Fig. 2.

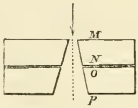


Fig. 3.

The aperture of entry, O, of the same bullet, into the second plank, will be found cleanly cut, and very much smaller than the aperture of exit in the first plank. This results from the fact that the fragments driven out of the first plank have no influence whatever on the second plank, which is separated from it. If, however, both planks be brought together, firmly braced (*see* fig. 3), and a shot fired through both of them, we shall have different results, for the second plank being close to the first one is acted on by the fragments driven out of it, and it will, therefore, be found that the aperture of entry, O, in the second plank is now large and irregular, clearly showing that the fragments cut out of an aperture of entry are the active agents in making the aperture of exit larger and irregular.

It is stated by some that an aperture of exit in either table of the skull is larger than the aperture of entry, because the distal table supports the proximal one, and that, therefore, the latter suffers less. If this were true, it ought to result, that if the distal table be removed, and a shot fired through the now unsupported table, a large irregular hole will be made. I accordingly cut away one table and the diploe with a trephine, whose diameter was three times as great as that of the bullet, and fired through the unsupported plate—the wound was as small and as clean cut as ever. This experiment I tried six times, equally on both tables, with always the same results.

If it be true that the loss of momentum sustained by the bullet in passing through the proximal table and diploe be the reason why it makes a larger hole in the distal table, it will result that, if the bullet has not to cut through the proximal table and diploe, and thus lose no momentum, it will produce a small clean-cut wound. I therefore performed the following experiments:—

At three points on one side of the median line of the skull, each in the frontal, parietal, and occipital bone respectively, I cut through the external table and diploe, with a trephine of the same diameter as the bullet, and thus isolated, but not removed, a button of bone, and, at corresponding points on the other side of the median line, I cut through and removed with the same trephine a button of bone out of the external table and diploe. Each spot was then fired on to successively; and the result was, that in each case where the button of bone had been removed, the aperture in the distal table was scarcely larger than the bullet, whereas in each instance in which the button of bone had been isolated, but not removed, the aperture of exit was just as large and irregular as usual. The differences between the apertures on one side of the median line and those on the other were very marked.

The above procedure was followed on the outside of two skulls, and on the inside of one skull, in each instance with the same results.

In fact, if the proximal table and diploe be removed with a trephine from any part of the skull, either inside or outside, and a shot be fired through the remaining plate, the aperture will be almost the same size as the bullet, and tolerably regular; but if, previously to firing, the button of bone be replaced after removal, then the result will be entirely different—the wound will be irregular and very much larger than the bullet; thus clearly showing that the bone cut out of one table and driven on to the other is the cause of the greater size of the aperture of exit.

If a bullet penetrates the skull at a low rate of velocity, why should it make a larger wound than that made by a bullet travelling at a great velocity? The bullet going at full speed affords no time for the part which it strikes and puts into motion to transmit motion to the surrounding bone, and hence merely cuts out a piece of bone its own size; whereas the bullet whose rate of velocity is low allows time for the part which it strikes to communicate force to, and set in motion a considerable portion of the contiguous bone not struck; and, consequently, the lower the rate of velocity, the larger will be the wound, for as more time is given, more particles will be set in motion. I have already stated that I have observed there is a gunshot wound of a peculiar kind produced after death, and so far as I have been able to ascertain, it cannot be made during life. If a ball penetrate at right angles both sides of the skull of a living person, the first aperture of entry will be of exactly the same diameter as the ball, regular, and free from any splinters or fissures; whereas, if both sides of a dead man's skull be pierced by one ball, then the first aperture of entry will be found rather larger than the ball, irregular, and generally complicated with fissures, thus differing entirely from what is seen in life. The rationale of the above is as follows—when a bullet strikes the living head with great velocity, the cranium, being fixed, resists the blow, and the bullet passes through without impressing any motion on it; but, after death, the head, being no longer fixed, partly yields to the impetus, and, therefore, as the time of the bullet's impact is longer, a greater number of atoms of bone are set in motion—thus causing a larger wound than is produced during life. If a bullet can perforate both sides of the cranial cavity it shows that it has sufficient power to go through the proximal table without making a larger wound than is necessary for its passage; consequently, if the aperture of entry be found large, irregular, and fissured, the cause of the altered facts must be sought for, not in any supposed diminution of the bullet's velocity, but, in the cessation of muscular contractility. If, however, a dead man's head be fixed, either artificially or by the rigor mortis, we can produce the same effects as in life. There is, therefore, a particular kind of gunshot wound which can be produced after death, but cannot be made during life. The converse of this, however, does not hold good.

In another communication I intend to make some further remarks on the subjects of this paper, and also, to give some observations of surgical interest.

Art. V.

On the Sanitary State of the Staffordshire Potteries, with especial reference to that of the Potters as a class, their Mortality, and the Diseases prevalent among them. By J. T. Arlidge, M.B. and A.B Lond., M.R.C.P. Lond., Senior Physician to the North Staffordshire Infirmary, formerly Physician to the West London Hospital, &c.

Few parts of England are, I believe, less known and less visited by English people than the pottery district of North Staffordshire; and yet it is the centre of one of the most important branches of manufacture in the country, and is becoming yearly more and more important on account of its mineral wealth in coal and iron. The manufacture both of earthenware and porcelain is here carried on, and, indeed, the greater proportion of the articles in use composed of those materials, not only in England, but also throughout the civilized world, are produced in that district.

Two centuries or more ago there were potteries in this neighbourhood, but their products, made chiefly from the ochreous clay found on the spot, were of only local use; and it was not until shortly before the time of the renowned Wedgwood, and nearly the middle of the eighteenth century, that the earthenware manufacture acquired much importance. From that time it has made rapid strides, its extension being largely due to the impetus given by the enterprise, skill, and artistic genius of Wedgwood, and to the opening of the Trent and Mersey Canal, whereby the import of raw material and the export of the manufactured goods became facilitated, and the trade was put into such a position that it could be profitably carried on and developed. For it is curious, at first sight, to learn that the materials employed in the manufacture of earthenware and porcelain are not products of the neighbourhood, but have to be imported into it from great distances, the greatest portion of the clays used coming from Dorsetshire and Cornwall, the clay of the neighbourhood being suitable only for the construction of the cases, technically called "saggars," in which the articles are baked or "fired." Nevertheless, it was doubtless the existence of this common clay that originated the manufacture in this locality, with the rude products of which our forefathers, in this country as well as elsewhere, were content for ordinary purposes. For it will be remembered that earthenware plates, dishes, and drinking-vessels are of comparatively modern production, and have replaced similar vessels of pewter and tin, and drinking-horns, in many parts of the country, within the memory of persons yet living.

The growth and successful prosecution of the pottery manufacture in this region is, in fact, due to the immediate presence of coals, which are consumed in enormous quantities in its several processes, and the cost of which constitutes a large portion of the total expense of production.

Reference to the reports of the Registrar-General will prove that Staffordshire is not a healthy county. The average death-rate for 10 years is 25 to 1000 living, and is only surpassed in Lancashire, where it is 26. However, it would be wrong to infer that this large death-rate is owing to the geographical and atmospheric conditions of the county, entirely or even chiefly; for Staffordshire is to a great extent a manufacturing and mining county, and it is a well-ascertained fact that manufacture and mining are inimical to human life.

But we must confine our observations to that part of Staffordshire in which the Potteries are situated. This region is in the northern part of the county, and is very hilly. Its hills are continuous by outlying ridges with the Peak range in Derbyshire on the east and north-east, whilst on the west and north-west they rise rather abruptly from the comparatively flat county of Cheshire, and a portion of the more level country of Shropshire. Consequently, the clouds, driven across Cheshire from the sea beyond, precipitate their rain on this hill country, and give rise to a rainfall much above the average of England. There is consequently a pervading moist atmosphere, and this is further increased by the nature of the soil, which is a stiff tenacious clay lying in relation with the new red sandstone,—the rock of the district, and very retentive of moisture. At the same time the elevation conspires with the humidity of the soil to produce a prevailing low degree of temperature below that met with in many regions farther north. Streams are abundant in the valleys, which are occupied with meadow-land, flooded frequently with water. The climate of the district may therefore be spoken of generally as damp and cold.

All the pottery towns are comprised in the parliamentary borough of Stoke-upon-Trent; although the town of Stoke proper, which gives it its name, is the smallest of the five principal towns which are included in it. These other towns are Hanley, Burslem, Tunstall, and Longton, the first-named being a borough town, and having the largest population; besides these are other intermediate and neighbouring hamlets having numerous inhabitants. In the poor-law returns all these places are classed as two unions, representing the very large ancient parishes of Stoke and Wolstanton, which contained a total population, according to the census of 1861, of 125,664 souls, of whom 71,308 lived in Stoke parish.

The several towns mentioned, excepting Stoke, are situated on a ridge of hills running north and south, and have suburbs or offshoots extending down the slopes on either side. Stoke itself is situated in a valley intersecting the range of hills, and through which the Trent flows, here a small stream, but very liable, together with some tributaries, to overflow and flood the flat land on either side. This position of Stoke on the level of the Trent renders its drainage difficult and imperfect, whilst the other towns are well situated for thorough drainage, although it is to be regretted they fail to take advantage of this circumstance, the large town of Hanley, for example, having no general system of sewerage, but each house having its cesspool.

The water supply is almost wholly derived from a reservoir, fed by abundant springs, situated between Stoke and the silk-manufacturing town of Leek. The growth of the several towns has overtaxed the arrangements of the Water Company, and there is often a great deficiency. This defect, however, is in process of being remedied.

As may be supposed, the rapid development of these pottery towns, their growth within a hundred years from mere villages and scanty hamlets to populous towns, has been unfavourable to the plan of their construction. The demand has been for small houses for workmen, and this has been supplied by every holder of a plot of ground, aided by some common bricklayer as architect, in his own way, and with that full licence enjoyed in this country of erecting dwellings wherever space can be found to place them without any regard to the principles of sanitary science or the health of their occupants. The consequence is the creation of several irregularly-built towns, having moderately wide roads here and there in the principal lines of traffic, but elsewhere presenting intricate streets, with still more intricate courts opening out of them, inimical to ventilation and fostering centres of disease. Another defect met with is the unpaved state of very many of the smaller streets, and the ill-made roads, full of puddles and laden with black mud in wet weather, or thickly covered with black dust (derived from the ash and refuse of the iron-furnaces and pot-works with which they are mended) in summer—a fine dust, very penetrating and irritating both to eyes and lungs. As may also be imagined, the atmosphere of the potteries is not commendable for purity. There is a constant belching forth of smoke into it from scores of ovens in which the pottery is baking, from a multitude of slip-house chimneys, of chimneys of mines and iron-works, and what is worse, from the blast-furnaces for smelting iron, for the smoke from these last is loaded with poisonous gases, such as sulphurous acid, which tell the tale of their destructiveness upon surrounding vegetation. Other sources of contamination are derived from the heaps of iron-stone in process of calcining on the surface of the ground, and from the flues of brick and tile ovens which are numerous in the district, and emit a very dense, suffocating smoke.

The pottery towns enjoy this advantage, however, that they are not grouped closely together into one dense city, but are extended in a rather interrupted manner along a line fully nine miles in length. Hence, although each one has a dense central portion or core, a large portion of it is dispersed in a more or less straggling manner, and from any one point access to open fields is readily obtained. In each division, indeed, a considerable proportion of the population can be scarcely considered as urban, although many members of it are employed during the day in one or other of the towns.

The population, as a whole, is essentially a manufacturing one; for, with the exception of a small agricultural class in the country around, it is divisible into the workers in earthenware, the workers in iron, and miners, with the accessory population of professional men and shop-keepers and labourers. After the outbreak of the American war there was great interruption of trade and much distress in this community, the Americans having previously been their largest customers. However, the new commercial treaty with France, and the opening up of a large market for their products in that and in other countries, has compensated latterly to a very great extent for the previous loss of American business. There is now therefore returning prosperity to the pottery manufacture, and the iron trade has also much improved recently. Hence this district may be considered at the present time as flourishing. Indeed, the condition of the population, as far as the comforts of life are concerned, is good. The wages of potters are higher than those of all, or almost all other artisans; and potters who are husbands and fathers possess the further advantage, so far as increasing their means is concerned, of being able to avail themselves of the labour of their wives and children in various departments of the manufacture. The superior hands among male potters earn from four shillings to eight shillings a day, and the women from eighteen pence to two shillings. Almost all the work is piece work.

The potters therefore should be a thriving people, and many are so, and by their frugality become possessors of small houses, whilst others enter into business on their own account. Indeed, very many of the existing master potters have risen within their own lifetime from the rank of working men, or are the sons or grandsons of those who have done so. However, it is much to be deplored that, among the many, there is great improvidence, especially in eating and drinking, and in dress. The chief beverage is beer, and there is much intemperance, with its associate vices, particularly at the close and beginning of the week.

The large majority of the workmen are Dissenters, every sort of sect having its partisans, and those sects being most flourishing which offer the highest phase of religious excitement. This matter of religious creed has this bearing upon the question of the health of the people, that the Sabbatarian and other restricted views of most bodies of Dissenters oppose a bar to many opportunities and means of out-door exercise and amusement favourable to health, and, on the other, lead to routine town life, in-door existence, and to the necessity of in-door relaxation, one part of which is, among the uneducated classes, pretty sure to be indulgence in eating and drinking, particularly in the latter. There is, moreover, no park, or place for public out-door recreation and association belonging to the towns to attract the people from the firesides of their houses or of the public-houses, and solitary walks in the country around are with rare exceptions not effectual in doing so.

Many of the miners come from Wales, and there is a very considerable Irish population engaged in miscellaneous labour, but almost all the potters are English born. The ranks of the potters are recruited very largely from the surrounding country. I have made a memorandum of the places of birth of potters coming under my observation at the Infirmary and elsewhere, and also of that of their parents and grandparents as far as could be ascertained. From these notes it appears that among 266 potters, male and female, 29 were themselves born in the country at a distance from the potteries, 9 in the neighbouring borough of Newcastle-under-Lyme, and 6 in surrounding rural hamlets, making a total of 44, or very nearly one-sixth of the whole number. Of the remaining 222, who were born in the pottery towns, both parents in 39 instances, and 1 parent in 54 among them, came from the country. The origin of the grandparents could not in many instances be ascertained, but the grandparents were country people on both sides among 14 potters whose parents were natives of the potteries, and of 22 such other potters one grandparent had come from the country. Almost all the immigrants into the potteries were from towns and villages in North Staffordshire, and from those of the adjoining counties, Salop and Cheshire.

The potters, as a class, are below the average standard in height, with large bones and not well formed. A deformity of the chest, consisting in a depression of the ensiform cartilage, and of the cartilaginous portions of the ribs in relation with it, is common among the "pressers," and probably is due to the pressure on that region exercised in carrying on their peculiar work, particularly in the earlier years of life. Again, potters are, as a rule, an anæmic race; have wide and prominent cheekbones, large mouths and lower jaws, and expanded orbits. The hair is usually brown, of various shades, and the eyes brown or greyish-blue. Many of the young women are fair and clear in complexion, and otherwise good-looking, but they rapidly decline in appearance, and get pale, and worn and anxious in expression, by continuance in the branches of labour—painting, burnishing, and transferring—in which they are mostly occupied, and which involve almost constant sitting and bending over their work.

There are many divisions of labour in the pottery manufacture, which comprises two departments—viz., the earthenware and the porcelain, differing, however, chiefly in the composition of the clay used, and not so much in the nature of the processes it is submitted to in producing the manufactured goods. The designations of the workmen, according to their branch of occupation, are, claymakers, throwers, turners, handlers, pressers, modellers, moulders, dippers, painters, gilders, printers, saggarmakers, firemen, placers, kilnmen, and warehousemen. The women are employed as painters, gilders, burnishers, transferrers, scourers, and enamellers, and as warehousewomen and helps to dippers, throwers, and other branches of male labour. There is also a large number of boys and girls from the ages of eight and ten upwards, who assist the men and women in various sorts of work until they are apprenticed about the age of fourteen. The boys are employed in making handles for cups, jugs, &c., in "wedging" clay—i.e., cutting and lifting lumps of clay, and throwing them with force upon another portion of clay or on the table before them, so as to drive out all air-bubbles from it; in turning "giggars," or the sort of wheel used by pressers; in "mould-running," or the running to and fro with the moulded articles from the presser's bench to the drying-stove; in the warehouses in sorting, and in other minor operations. The girls help the transferrers, "cutting papers" for them, paint simple patterns on the ware, or burnish it, assist in the warerooms, &c.

It would take up too much space in a paper of this sort to describe the character of the processes in which the several kinds of workmen and workwomen enumerated are engaged. They need be seen to be understood, and are well worth inspection. It will suffice to point out what are the conditions most likely to affect health in the principal divisions of the manufacture. The largest class of potters is that of the "pressers." These artisans are further distinguished, according as they produce flat-ware, such as plates and dishes, or hollow-ware, such as ewers, soup-tureens, and foot-baths, into "flat" and "hollow-ware pressers." Their work consists in compressing the clay in the moulds of the article to be made, and involves much pressure upon the chest and epigastrium, and frequent interruption of the respiratory process. The firemen and kilnmen. and in a less degree the placers, are exposed to great heat, and at the same time to currents of cold air; and the printers also work over stoves nearly at a red heat, in confined workshops, and in an atmosphere robbed further of its vital air by the presence of transferrers and their assistants. The "dippers" are occupied in immersing the ware in the glaze—a compound containing lead and borax, and therefore highly productive of lead colic and paralysis in various degrees. Women and also children are employed as assistants to the dippers, and are frequent sufferers from the lead poison, as likewise are the "glost-placers," whose business it is to place the ware, after being glazed, in the clay boxes in which it is to be baked. The most unhealthy occupation of women is that called "scouring," consisting in the rubbing off the little siliceous particles which roughen the surface of the baked ware. Most of the other departments of the potter's art, such as gilding, painting, and burnishing, are sedentary in character, and therefore principally prejudicial to health by the prolonged sitting posture, by the leaning over the work, also pressing it at times against the chest to steady it, and by the confinement for many hours in workshops too frequently badly ventilated, and having the air vitiated by the breath of numerous others. For it is worth while to note in passing that the pottery artisans have great prejudice against the admission of fresh air into their work-rooms, for fear of draughts, and therefore keep the windows closely shut, and cover the ventilators, where these have been introduced, to keep out the dreaded foe. The act of burnishing—i.e., rubbing the gilded surface with an agate or other hard stone, so as to bring out its lustre, is rendered more baneful than it would be as a simply sedentary occupation, by the necessity of moistening the burnished surface—a requirement almost invariably met by using the saliva by spitting, for the girls and women find this fluid the most ready and suitable to their purpose, though I doubt not some mucilaginous fluid would be found, if attention were given to the matter, equally serviceable, and assuredly more salutary and cleanly in character.

There are subordinate divisions of labour, only one of which I need mention—viz., "lathe-treading," which is commonly done by women or girls, as assistants to the turners engaged at the lathes, and is a tiring, treadmill-like operation, involving, however, more a jumping movement than the treadmill, and so far more fatiguing.

There is one circumstance about the pot-works of Staffordshire particularly striking and inexplicable to the visitor, and that is the little use made of machinery. On all sides he observes various operations carried on by human labour at much sacrifice of health, and at a large pecuniary cost; and he is surprised that the ingenuity of the mechanical engineer has never been put into requisition to save this unnecessary expenditure by the invention of machinery to effect the same ends, especially as these ends are apparently so much more simple than those accomplished by the beautiful mechanical contrivances introduced in other manufactures with such immense advantages to their prosperity, and, indeed, to that of the operatives engaged in them.

The explanation of this anomalous state of things is mainly to be found in the blind and mischievous jealousy of the men, who fear the effects of machinery on their earnings, and particularly on what they gain by the labour of their wives and children, which is largely of the sort that machinery would replace. They seem not to perceive that the extension of their trade by cheapness of production, and thereby the shielding of it against rivalry, must eventually be for their own gain, though it may derange the existing mode of remuneration for a time. Mr. Alderman Copeland has for some years, indeed, employed a machine for turning some of the potters' wheels, though it has met with little favour and no imitators; and latterly the clay has, by a clever piece of mechanism, been prepared of the proper consistence by pressure in some few factories, instead of by evaporation, as previously effected in the so-called "slip-houses." Other recent inventions to save human labour and preserve health, but as yet adopted in very few pot-works, are the "pug-mill," to perfect the clay for use, and save the process of "wedging," and a rotary enclosed drying-room, in lieu of the heated chambers directly communicating with the workshop of the pressers, which overheat the room and also necessitate perpetual running to and fro on the part of the "mould-runners." This last-named invention is most valuable, for the employment of young boys in this kind of work involves much labour, even in running from place to place, and also, which is worse, a constant transition from a high temperature of 130°, 140°, and even more, to that of the adjoining workshop and other places not heated. This occupation of the boys has always attracted the attention of those who have concerned themselves with the sanitary condition of potters, the conviction being that, by this exhausting work, coupled as it mostly is with "giggar-turning," the seeds of future disease and debility are laid in the youthful frames subjected to it.

Reviewing the apparent causes of disease present in the occupation of potters as a whole, we discover them in the generally highly heated and mostly badly-ventilated workrooms; in the confinement inevitable upon the work; in the sedentary nature of much of it; in the operation of noxious preparations in a few branches; and generally, with regard to all those working with the clay, in the diffusion of much dust in the air around and its inhalation.

I shall presently show how rife and how fatal pulmonary disease is among potters, and particularly among those working with the clay. The exciting cause is plainly the penetration of the dust within the lungs; for this shows itself in the sputa during life, and in the pulmonary tissue after death. Predisposing causes are found in the debility induced by the other conditions of their employment above enumerated, by injurious pressure on the chest, by neglect of invigorating out-door recreation, and too often by irregular and intemperate habits. That the dust from the clay used in potting would be peculiarly pernicious might be assumed *à priori* from a knowledge of its composition, consisting as it mainly does of disintegrated or naturally decomposed granite, from Cornwall and elsewhere, mixed with finely-powdered flint. Moreover, in respect to this cause of disease, the occupation of the potter is assimilated to that of stone-masons, who, it is well known, —where stone is largely used in building, are cut off early in life by chest-diseases, engendered by the inhalation of the silicious or calcareous dust dislodged in their work.

This preliminary notice of the divisions of labour in the earthenware manufacture, and of the apparent sources of disease to be discovered in connexion with them, will prepare the reader to better comprehend the subsequent remarks on the mortality and diseases of potters.

There have been three investigations instituted by Government into the sanitary state of the potteries, and particularly with reference to child-labour. The last was conducted, in 1862, by Mr. Longe, whose interesting Report, followed by one by the Commissioners, is published in the First Report of the Children's Employment Commission, in 1863. Besides Mr. Longe's own observations, the Report contains several letters from the medical men of the neighbourhood expressive of their views relative to the employment of young children in the potteries and to the health of potters. Among them is a letter written by myself in reply to a series of questions submitted to me by the Assistant-Commissioner, the remarks in which were considered by some of the public too sweeping in character and defamatory of the fair fame of the health of the neighbourhood. At that period, indeed, I was comparatively a new comer into the district, and therefore my impressions were more vivid, and the contrasts with past experience elsewhere more pronounced. However, after the lapse of eighteen months since the letter was written, and after constant attention and examination into the sanitary condition of potters, I find no cause to modify my statements in any material point, as the statistics and facts in general to be now adduced afford a sufficient confirmation of them. On one matter only, the relative prevalence of scrofula among potters, I am not yet prepared to establish the definite proportion of two-thirds as then advanced, although I have the conviction that that ratio is not far wrong when, besides actual scrofulous disease manifested in the glands and bones, the strumous diathesis, as distinctly indicated, is taken into account. It must always be borne in mind that in this and similar matters of observation I am speaking as a medical man, from cases of potters applying to me as private or as Infirmary patients.

The first fact to be taken into consideration is the enormous mortality of children in the pottery towns. I have carefully analysed the registers of deaths in 1862, in Stoke parish, which had in 1861 71,308 inhabitants, and find that 616 deaths occurred under the first year, and 498 at one year old and under five, which, relatively to the number of children—viz., 2437 and 8031 respectively of the same ages living—represents a death-rate of 25·27 per cent. for those of the former and 6·20 for those of the latter period of life. In other words, one-fourth of the whole number of children born perished within a year of their birth. In England at large this death-rate is 17·73 per 100; consequently, that in Stoke is nearly half as much again, and the deaths among infants, instead of numbering 616, should not have been more than 430, at the average of the whole country.

The proportion of deaths of children under five years of age has exhibited a similar high range to the whole mortality of the district. In Wolstanton parish, in 1857, the deaths under five years of age were 645 of the whole number, 1217, or 52·99 per cent., and in 1861 were 588 of 1159, or 50·73 per cent. Likewise, in Stoke parish, the deaths under five were in the former year 46·23, and in the latter 50·22 per cent. of the whole mortality, and again, in 1862, 49·86 per cent. The fact is, therefore, that one-half of the entire number of deaths, in any one year, occur among children under five years of age, and upwards of one-fourth among those under one year old.

An inquiry into the causes of this excessive mortality of young children exhibits the results shown in the following table, in comparison with England at large :—

Deaths of those under Five Years old to the Number Living.

Population in Stoke under five years, 10,468.			Population in England under five years, 2,700,782.		
Causes of death.	No. of deaths.	Ratio to 100,000 living.	No. of deaths.	Ratio in 1861 to 100,000 living.	Average ratio for ten years to 100,000 living.
Diseases of lungs	210	2000	29,449	1090	1040
Consumption . .	50	477	3,052	113	
Zymotic diseases	265	2531	53,654	1986	
Convulsions . .	282	2693	29,291	1084	
Cerebral diseases	49	486	3,208	118	

The most prominent facts seen in this table are the great mortality of such young children in Stoke parish from each of the groups of causes tabulated, and especially from lung diseases and consumption together, and from convulsions and cerebral diseases. The ratio of deaths from consumption and from cerebral disease is above four times that found in all England, and that of those from convulsions more than twice.

With reference to the whole mortality in Stoke in 1862—viz., 2107 deaths at all ages—260 occurred among children under five years of age from diseases of the chest and consumption, or 12·37 per cent.; 295 from zymotic diseases, or 14·00 per cent.; 178 from marasmus, debility, atrophy, and tabes mesenterica, or 8·44 per cent.; 49 from cerebro-spinal disease, or 2·32 per cent.; 282 from convulsions and teething, or 13·37 per cent.; and 80 from all other causes, or 3·79 per cent.

A calculation made of the relative mortality among children at the three different periods—viz., aged one and under, above one and under five, and five years old and under ten—shows that the ratio of deaths from consumption and phthisis declines nearly one-half after the fifth year is attained; that marasmus, debility, tabes, &c., decline after the end of the first year from nearly 20 to 5 per cent., and convulsions from 30 to 10 per cent. On the other hand, cerebral and spinal diseases rise from nearly 4 to 10 per cent., and zymotic diseases from 16 to 42 and 45 per cent.

The destruction of infantile life by diseases of the strumous class, as represented by a majority of the deaths assigned to marasmus, tabes mesenterica, atrophy, and consumption, and by a large proportion of those attributed to cerebral diseases and convulsions, is greatest among those aged one year and under, and is indicative of the procreation of a very numerous feeble progeny. This conclusion will hold good even after allowing for the operation of various conditions unfavourable to infant existence, such as too early marriages and neglect and ignorance of mothers, many of whom are occupied in work away from home and leave their infants in the hands of unfit persons, and often deprived of their natural food, the breastmilk.

The next fact I would note is the prevalence of chest-diseases and consumption in the potteries. Owing to the loose way in which the registration of deaths is carried out, and the imperfect diagnosis often made between phthisis and some forms of chest-disease, especially the variety so common among potters, known as potter's consumption, or potter's-asthma, it will be well to frequently group the two together under the general term, "Diseases of the Respiratory organs." An analysis of 913 deaths in Stoke among those aged ten years and upwards, shows that 41·52 per cent. were owing to these diseases of the respiratory organs. The next highest ratio was that of cerebro-spinal disease and epilepsy, which was 10·07 per cent.

The death-rate of adults per 100,000 living is shown in the following table:

Deaths of those aged Twenty Years and upwards to the Number Living.

Population in Stoke aged twenty and upwards, 37,460.			Population in England aged twenty and upwards, 10,983,558.	
Causes of death.	No. of deaths.	Ratio to 100,000 living.	No. of deaths.	Ratio to 100,000 living.
Diseases of lungs . .	155	413	32,577	296
Consumption	181	483	39,622	367
Zymotic diseases . .	58	154	16,652	151
Cerebral diseases . .	79	210	24,795	225

This table clearly shows how very high the death-rate from diseases of the lungs and from consumption is in the potteries among adults of both sexes. But if we take males by themselves, its proportion is still more pronounced, particularly in the case of lung-diseases, for then 505 per 100,000 living represents the death-rate both of these maladies last mentioned, and also of phthisis. The destruction of life in Stoke, therefore, from these causes is greater among males than females; and on instituting a comparison with the death-rate from them in England, we find in Stoke the relative numbers to be 505 against 339 for chest-diseases, and 505 against 373 for consumption, for adult males only.

The registers of deaths in Stoke parish furnish data for calculating the mortality prevailing among potters as a class. Unfortunately, however, those data are imperfect, inasmuch as the records of deaths fail in a large number of instances to indicate the occupation, and more particularly so in the case of females. Indeed, so faulty is the registration with regard to females, that it would be useless to appeal to it for the facts required; consequently, the following calculations are worked out only for male potters:

The death-rate in Staffordshire was stated, at the commencement of this paper, to be 25 per 1000 living; that of male potters amounts to 30. An examination of the mortality of adults in connexion with their age shows that in the ten years of life, from fifty to sixty, nearly one-half of the whole number of deaths occurred among potters; that from forty to fifty, and again from thirty to forty, more than one-third; from twenty to thirty, little less than one-third; and from sixty to seventy, and from ten to twenty, rather more than one-sixth, took place among those workmen. And here I should state that the adult male potters do not constitute one-third of the male population living.

The proportion of deaths among potters, just quoted, implies that the occupation of potters is connected with a rapidly-rising ratio of mortality after the twentieth year, which advances to its maximum in the decennium between the fiftieth and sixtieth year of life. This progressive ratio is, on the contrary, not remarked among those not potters by trade, and with whom the ratio of deaths is highest in the decennium between sixty and seventy.

The most fatal period among potters is between the twentieth and sixtieth years, during which the mortality among them equals 37.91 per cent. of the whole adult male mortality in the district.

The mean age at death of male potters—of twenty years old and upwards, was forty-six and a-half years, and that of males, not potters, may be estimated at fifty-four.

The causes of death of 496 males, aged ten and upwards, are set forth in the following table, potters being distinguished from others:

	Potters.		Males not Potters.	
Diseases of chest . .	39=7·86	per cent....	61=12·29	per cent.
Consumption . . .	46=9·27	,, ...	64=12·90	,,
Cardiac diseases . .	11=2·21	,, ...	20= 4·03	,,
Nervous	17=3·42	,, ...	32= 6·45	,,
Abdominal viscera .	6=1·20	,, ...	26= 5·24	,,
Zymotic	9=1·81	,, ...	34= 6·85	,,
Old age	5=1·00	,, ...	27= 5·44	,,
Various and uncertain	5=1·00	,, ...	37= 7·45	,,
Accident	1=0·20	,, ...	56=11·29	,,

It follows from this table, that the most prevalent causes of death among male potters, compared with other males, are diseases of the chest, consumption, cardiac diseases, and diseases of the nervous system; it being kept in mind that those artisans are less than one-third, or 31·25 per cent. of the whole male population at the same ages. Thus more than half of the whole number of deaths from chest diseases occurred among them: three-fourths of those from consumption, rather more than half of those from cardiac diseases and from disorders of the nervous system. With respect to all other classes of disease enumerated, the ratio of potters is below one-third, more or less considerably.

Now those maladies which are thus proved to be most fatal to potters are precisely those which might, *à priori*, be anticipated so to be, from the nature of the morbific causes to which those workmen are exposed, as previously commented upon. Diseases of the respiratory organs are attributable to the dust, the heated and ill-ventilated rooms, prolonged sedentary work, constrained position and often pressure on the chest, too early and continuous employment as children, and inherited debility from parents subjected to the same class of causes. Cardiac diseases might be looked for to be common among them as sequelæ to rheumatism generated by heated rooms and excessive variations of temperature; whilst causes for disorders of the nervous system are found in the debilitating agencies previously enumerated, and in the poisonous effects of lead used in the glazing process.

An inquiry relative to the mortality among male potters themselves from diseases of the lungs and consumption, to the whole number living—viz., 5813, according to the census of Stoke parish in 1861, proves that 6·36 per 1000 living, die from the former group of maladies, and 7·22 per 1000 from phthisis. If the town of Longton be taken, in which the registration of the employments of those deceased is carefully kept, the proportion of deaths of potters to 1000 living, from the diseases in question, is very much higher—viz., 12·85 and 11·34 respectively. And although the mortality in Longton from these causes may be actually greater than in Stoke parish at large, yet it must be presumed that were the occupations as well registered elsewhere as in that town, the wide difference in the ratios presented would not exist.

It has been previously stated that the death-rate from each of the two groups of diseases, those of the lungs and of phthisis, is 505, or 1010 for the two together in every 100,000 living of adult males in the general population of Stoke; and we now find the death-rate in potters to equal 1358, and in the instance of Longton 2420. Comparing this death-rate of adult male potters with that of male adults in England, from the same causes, the excess is still more striking, being as 1358 to 654, or more than double the amount.

The deaths of male potters from diseases of the respiratory organs, in relation to the entire mortality among them from all causes, constitute 60 per cent. as opposed to 27 in England at large. The maximum of deaths from those maladies occurs in the decennium of life from 50 to 60, and declines progressively in each antecedent decennium as the twentieth year is approached. In the twenty years of life between 40 and 60, 37 of the whole number of 85 deaths from those diseases occurred, or 43·52 per cent. On the contrary, the mortality from phthisis alone reaches its maximum at an earlier decennium, that, namely, between 30 and 40 years of age, and the inference is, that phthisis cuts off potters predisposed to it in the largest proportion prior to the fortieth year; whilst those not so predisposed fall victims to those forms of chest disease, not tubercular, which are more directly the consequences of their occupation.

So much for the causes of death as registered. I will now examine what diseases are prevalent among potters from observations collected at the North Staffordshire Infirmary. And I would here premise that the experience of this institution will more fairly and fully indicate the medical history of potters than that of hospitals or infirmaries as elsewhere constituted; for there prevails in it a system of "establishment subscriptions"—i.e., of subscriptions levied weekly among the operatives in most of the factories around, which entitle them to medical relief at the Infirmary. Hence this hospital is largely converted into a medical relief club, and as a consequence does not afford assistance only to the indigent sick, but also to numerous workpeople who otherwise could find means to pay for medical services rendered. This is not the place to discuss the merits of this system, but I must denounce it as very inequitable both to the medical staff of the institution, who render gratuitous service, and also to the whole of the medical practitioners in the neighbourhood.

To return: I have extracted from the hospital-register notes of 112 potters, male and female, and of the maladies for which they were admitted in-patients in the course of the year 1860. Of these 112 patients, 17 males and 3 females had bronchitis; 2 pneumonia; 4 pleurisy; 8 males and 7 females, phthisis; 17 males and 3 females, rheumatism; 3 of each sex, cardiac disease; 10 males and 3 females suffered from the effects of lead; 3 males and 1 female from paralysis; 3 of each sex from chorea; and 6 females from disorders of menstruation. Of other diseases enumerated, there were only one, two, or three examples of each. Of these 112 in-patients, 79 were males, and among them lung diseases stood for 27·8 per cent., phthisis for 10·1 per cent., and the two together for 37·9 per cent. Rheumatism equalled lung diseases, being 27·8 per cent., whilst lead disease was 12·6 per cent.

Lung diseases and phthisis do not here assume so high a ratio among potters as in the mortality tables; but it is to be remembered, that cases of phthisis in the advanced stages are not admissible, and that the cases entered as bronchitis included many belonging to that form of lung disease peculiar to potters, and which, being incurable, return to their homes to swell the number of those dying from such disease. This disease, indeed, is a lingering one, gradually incapacitating the man from his work, and the wards of the Infirmary are therefore not so much resorted to on account of it; but the sufferer when unable, it may be, to attend as an out-patient, and anticipating its termination, prefers to die at his own home.

Between October, 1863, and the end of May last, I have made memoranda of all the potters, male and female, aged ten and upwards, coming under my care as out-patients, and also of many in-patients. In all, I have noted the medical history in 163 males and in 104 females occupied in the different departments of the earthenware and china manufacture. Among these I find 34 males and 21 females to have been ill with phthisis; 54 males with chronic (potters') bronchitis, and 11 with recent or acute bronchitis, and 9 females with that disease in its ordinary forms; 13 males with rheumatism, general and local, and 3 females; 17 males with the poison of lead, and 4 females; 10 males and 25 females with acute and chronic dyspepsia; 5 males and 4 females with cardiac disease; 6 males with cerebro-spinal disease, and 1 female; 4 males and 3 females with epilepsy; 3 males and 9 females with anæmia and debility; 7 females with leucorrhœa, with debility and over-lactation; 5 with disorders of menstruation, and 4 with neuralgia. The other maladies specified are individually represented by a few units only.

Thus, of 163 males, 65 had diseases of the lungs, or 39·8 per cent.; and 34 had phthisis, or 20·8 per cent. These proportions are higher than in the instance of in-door patients, showing that in the stages of those diseases in which they are able to get about and attend to work more or less, they will avail themselves of out-door to a larger extent than they will in-door treatment when their condition is worse.

On the contrary, the sufferers from rheumatism who applied as out-patients constituted only 6·7 per cent. as contrasted with 27·8 per cent., the proportion in which they entered the Infirmary for treatment; a circumstance explicable from the consequences of rheumatism disabling them from work, and rendering in-door treatment of direct and immediate value to them.

Among the women, it is seen that phthisis is almost equally prevalent as among the men, representing 20·19 per cent.; whilst bronchitis was the cause of complaint in only 8·6 per cent. of their number, as opposed to 39·8 per cent. among men; a marvellous contrast, intimating clearly enough that diseases of the lungs among potters are little attributable to the climate and those external conditions to which men and women are alike exposed, but referrible pre-eminently to the occupation of the former sex. On similar grounds is explicable the fact of the slight comparative prevalence of rheumatism among females engaged in the pottery factories.

It may be further noted, that among the women those maladies engendered by sedentary habits in warm, close, ill-ventilated rooms, such as dyspepsia, anæmia, and debility, are much more rife than among the men, whose work is of a more active sort. That lead disease appears more common among men than women is owing to the much larger number of the former employed in departments of labour in which that mineral is used. It has been observed that women who "work in the lead" are particularly prone to miscarriage.

The preceding figures demonstrate that diseases of the lungs and phthisis together constitute 60 per cent. of all the maladies for which relief is sought at the North Staffordshire Infirmary, and chiefly for relief as out-door patients. If we go a step further and inquire what class of working potters are most largely affected by those diseases, it will be found that they are the "pressers," and this in a proportion beyond all others after making allowance for the greater number of them relatively to other divisions of workmen in the pottery manufacture. Thus, of the 34 males afflicted with phthisis, 21 were pressers; and of the 65 suffering with lung diseases, 41 were such. Among workmen following other branches of labour, no special proclivity to these maladies exhibits itself in any one of them.

The prevalence of scrofula in the population of this part of Staffordshire, including potters, is doubtless extensive, as is shown as well by the lists of surgical as by those of medical cases; but on this topic I have not at present opportunity to enter.

There is one great cause of disease and early death among potters which I have not considered—viz., the early imposition of labour in the factories in childhood; for I have confined myself chiefly to showing what is the mortality and what its causes in North Staffordshire, with especial reference to the staple branch of industry in this district of the Potteries, and have only reverted in a general manner to the causation of the prevailing diseases. I might, however, have insisted much on the necessarily injurious influence of the conditions existing in the nature of the work and in the circumstances of the workshops of potters upon the immature, growing frame of childhood, aggravated as all those conditions are by the many hours' work exacted. However, there is less need for me to undertake this task, as the subject of children's labour has been so recently examined into by a special Commission, and elaborately reported upon. The Government has taken steps to extend the operations of the Factory Act to the pottery manufacture; and no one who reads the foregoing pages illustrating the havoc of disease among potters but will appreciate the fact that much of it is preventible, and enter fully into the wishes of the Government to protect children from labour for too long a period, and at too early an age, and generally to provide for improved sanitary measures both as regards the workmen and their workshops.

PART FOURTH.

Chronicle of Medical Science

(CHIEFLY FOREIGN AND CONTEMPORARY).

HALF-YEARLY REPORT ON PHYSIOLOGY.

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I. BLOOD, PANCREAS, SPLEEN, ABSORPTION.

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6. DELORE, M.: *On the Absorption of Medicines by the Healthy Skin.* (Journal de la Physiologie, No. 22, vol. vi. p. 249.)
7. MM. A. CHAUVEAU and MAREY: *Cardiographic Apparatus and Experiments.* (Mémoires de l'Académie Royale de Médecine, t. xxvi. part 1, p. 268.)

1. The subjects of Dr. Panum's investigations were dogs, and he believes that he has proved that in complete inanition no essential or remarkable alteration is produced either in the proportion of blood generally to that of the body, or in the relative proportions of the chief constituents of the blood (that is to say, of the corpuscles and fibrin) to one another. No doubt the absolute quantity of blood constantly diminishes during the progress of starvation, but it certainly does not diminish in a greater proportion than the whole mass of the body, and the different opinion held by Chossat and by Bidder and Schmidt, is due to the incorrect method employed by them to exhibit these relations. This maintenance of the normal relative proportions of the chief constituents of the blood in complete inanition receives its full significance when it is shown that it still exists, though the animal is allowed to drink at will, for it follows that the materials destined for the nutrition of the tissue which have been absorbed from the intestine, as well as oxygen and the products of disintegration —carbonic acid and urea—only transiently form constituents of the blood; with

deficient supply, the formation of the tissues, the so-called progressive metamorphosis is soon arrested, for the mass of the solid constituents of the blood do not, to any extent at least, undergo alteration, and are thus unable to furnish directly the requisite material. Consequently the blood, as a whole, is not the material of nutrition, but is in reality only a means of transport for nutrient compounds —in other words, an organ occupying an intermediate place between the tissues and the substances absorbed from the intestine. Hence, also, the important conclusion may be deduced that neither the blood-corpuscles nor the fibrin is the true or essential material of nutrition: for their quantity in relation to the total body-weight, does not diminish in the proportion which would occur if they were consumed as pabulum for the nourishment of the tissues. On the other hand, the constant, though not very considerable, diminution of the solid, and especially of the albuminous constituents of the serum, renders it very probable that a portion of these is to be regarded as the material really consumed in the nutrition of the tissues.

2. Thiry, in his essay, attempts to prove that the cause of the speedy cessation of the heart's action which occurs when sudden and complete asphyxia is induced, is the excitation of the roots of the pneumogastric nerves, by the circulation of blood charged with carbonic acid through the medulla oblongata. An inhibitory influence is thus propagated to the heart, which effects its stoppage in diastole. This occurs within ten seconds. The recommencement of pulsation is either due to the circulation of oxygenated blood consequent upon the recommencement of respiration, or to the exhaustion of the vagi. If these nerves be cut, and asphyxia be suddenly induced, the heart's action only very slowly ceases.

3. Demarquay and Leconte have made a series of observations on the physiological action of oxygen on dogs. They found that these animals were capable of respiring oxygen for a long period of time without other apparent effect than increased liveliness and augmented appetite. They then made extensive wounds in the axillæ of the animals, and observed—1. That the wound became considerably congested; 2. That a flow of transparent serosity took place from the injured surface; 3. That, after long exposure to the gas, numerous petechiæ or small ecchymoses made their appearance; and 4. Closely similar effects were observed when oxygen was directly injected into the blood. The injection of the gas into the veins requires to be undertaken with care; but it was found that nearly two quarts could be injected without killing the animal, if it were introduced through the vena porta or through the vena cava below the liver; the venous blood in these instances did not appear altered in colour, the spleen alone, as though it were a blood-gland (an organ of hæmatosis), acquired a scarlet tint. All the abdominal veins became turgid, the increase in the quantity of the blood in these parts, obviously resulting from the experiment. In other experiments made on rabbits, it was found—1. That these animals could live from fourteen to seventeen hours in pure oxygen; 2. That when death occurred, the muscular system was universally engorged with blood, and had assumed a peculiar rosy tint; 3. That the ordinary difference in colour between arterial and venous blood, contrary to the opinion of Broughton, was perfectly well marked; and 4. That in opposition to the statements of Beddoes, no organ was found inflamed or gangrenous.

On applying oxygen gas to wounds in the human subject, no acute pain was perceived, but pricking and heat were complained of. When the gas was injected into the mucous or serous cavities the same sensations were produced. In one instance it effected the radical cure of hydrocele. When placed in contact with healthy wounds, the suppurative process becomes modified, the purulent discharge in a few hours becoming less abundant and thinner, the granulations smaller and greyer in tint; but on the removal of the oxygen they assume a bright colour, and if it be applied several hours in the same day it may induce acute inflammation. It rapidly modifies and removes the inflammatory circle of redness which surrounds ulcers, eczema, &c. Oxygen, when respired by man to the extent of twenty-nine or thirty quarts, produces little effect. Various sick persons in these experiments derived benefit from such a dose daily repeated; they perceived sometimes a little heat in the pharynx, and a little confusion in the head, or headache; the pulse usually rose a little in frequency and force, but sometimes fell; the appetite improved, and there was a general sense of comfort and of increased energy. It does not appear to suit those greatly exhausted by suppurating wounds, or those in the later stages of phthisis.

4. Corvisart made the following experiments with the pancreas of a man who, in full health, fell and dislocated his femur. He was chloroformed and died. Three hours before death he had drunk two hundred grammes of milk. (about half a pint.) The weather was very cold. The pancreas was minced and infused in four hundred grammes of cold water for half an hour, the vessel being occasionally shaken. The liquid was quickly filtered, and whilst a portion was digested at a temp. of 104° F., with various aliments, another portion was acidified with hydrochloric acid, and a third was rendered alkalescent. It was found that all these fluids—neutral, acid, and alkaline—possessed the same energetic solvent power on fibrin and albumen. Experiments, made with a larger quantity of the fluid on boiled albumen, led to the same result, seven or eight-tenths of the solid albumen disappearing. Another portion acted on raw fibrin with great rapidity, digesting it in half an hour, and completely dissolving it in an hour. The whole amount of ferment obtained from the pancreas was sufficient to effect the digestion of a quantity of albumen equivalent to about six eggs, and of a quantity of fibrin amounting to more than double that quantity, or a quantity of nitrogenous material equal to half the rations of a French cavalry soldier.

5. Patellani and Moroni's observations were made upon a young dog that had had the spleen removed for eight months. Perfect recovery had taken place from the operation; the animal remaining brisk, and possessing an excellent appetite. The sexual powers were very vigorous, and, coupled with bitches, healthy offspring were produced. Whilst under observation the sensory and motor faculties were perfect, he was very lively, intelligent, docile, and affectionate; the respiration was normal and free; the oral mucous membrane and tongue were moist, clean, and rosy; the skin was natural, sleek, and dry, possessing little odour; the animal heat natural, his appetite not remarkable, the animal being contented with bread and soup, he was well nourished, but in four months he did not gain in size or weight (19 lbs.); on taking animal food he vomited mucus and saliva; the urine was passed abundantly and frequently; the fæces were discharged in pélotons, of brownish colour, sparing in quantity, and only once a day. A year after the operation had been performed the animal was poisoned by woorara, on account of this agent producing no organic change of grave importance. On opening the belly, the entire absence of the spleen was attested, the general aspect of the intestines was normal, and a careful examination of the several organs disclosed nothing abnormal. The blood was healthy in appearance, that of the jugular vein presenting red, spherical, non-nucleated corpuscles, with fat granules, which latter were wanting in the blood of the left heart. The corpuscles of the lymphatic fluid were sparing in number, the lymphatic glands were apparently normal, but the thyroïd was diseased, being composed of a stroma of connective-tissue, the cellules of which were filled with a viscid, yellowish, albuminous plasma. They give an historical review of the various opinions which have been held respecting the functions of the spleen, and they conclude by remarking, that the most reasonable and probable view is that which considers the spleen to be a diverticulum for the blood from the liver, becoming con-

gested in the periods of inaction of this organ, in violent exercise, in efforts to vomit and in exertion of the voice.

6. The conclusions drawn by M. Delore are—(1) That the healthy skin is capable of absorbing all substances soluble in water. (2) The process is sufficiently uncertain in its activity to render it doubtful whether the iatroleptic plan of treatment can ever be generally employed, though it fully justifies the application of important medicines like sulphate of quinine, when circumstances prevent their internal exhibition. (3) Cutaneous absorption is favoured or opposed by various conditions having reference to the subject, the nature of the substance experimented on, and the mode in which it is applied. As a general rule, the softer and more delicate the skin or part of the skin, the younger the subject, the greater the extent of surface, the longer the time, and the more vigorous the infrication, the more energetic will be the absorption. As regards the nature of the substance, the soluble salts with which experiments were made, as iodide and ferrocyanide of potassium and sulphate of atropine, seem to be absorbed in about equal proportion. Insoluble substances were never absorbed. Thus, though iodide of lead produces its effects when applied to a wound, it is due to its easily undergoing decomposition, since it is not absorbed by the skin. As regards the vehicle in which the salt was applied, it was found that water was inefficacious, and that oily substances, so long employed for this purpose, possess no special power in producing absorption. The great secret is, in all instances, to produce irritation, and to this the effects obtained on applying alkaline and alcoholic preparations are attributable; it must be understood, however, that the term irritation thus applied may indicate a condition coincident with the production of a sedative or local anæsthetic effect, as after the employment of opium, chloroform, &c. The best mode of producing absorption is by friction with moderate pressure sustained for some length of time.

7. The experiments of MM. Chauveau and Marey were undertaken in consequence of differences of opinion still occurring amongst those who have constant opportunities of observing the characters and succession of the various and complicated movements of the heart. The text of the essay is chiefly occupied in describing an ingenious pneumatic sphygmograph, essentially composed of a flexible tube, terminating at its extremities by two ampullæ, one of which can thus be readily applied to the surface of the heart, artery, or chest, whilst to the other a light mechanical apparatus is attached, by which a lever is set in motion, registering its movements on a rotating drum. Its description is preceded by a carefully-worded note, which, as it gives an excellent account of the views published within the last few years by M. Chauveau on the movements and sounds of the heart, we shall here furnish an abstract of. Many of the statements will be found in full accordance with those of Dr. Halford and other English writers.

The horse was chosen for experiment, on account of its large and slowly-beating heart; and the spinal cord was divided between the atlas and occipital bone—a proceeding which in no way interfered with the cardiac movements, the heart continuing to act with regularity for a whole day. The following points were then carefully investigated:

The mechanism of the movements.—a. There is a period in each entire revolution of the heart's action when it is in a state of absolute repose; this is the pause, and the heart is then soft, flaccid, and yielding to pressure; it sinks down easily from its own weight, and moulds itself upon the subjacent parts, or in the chest during life upon the surrounding parts, as the ribs, sternum, and lungs. The finger introduced into the interior of the organ discovers that the auriculo-ventricular valves are depressed; and it is at this moment, termed the general diastole, that the ventricles are filled by the afflux of blood discharged by the veins into the auricles. *b.* The auricular systole which succeeds this state of general diastole is sudden and transitory. It may, however, always be clearly distinguished from the contraction of the ventricles which succeeds it. It diminishes, but only to a trifling extent, the size of the auricular cavity, and the comparatively slight pressure which it exerts upon the blood causes a reflux of blood into the veins, as well as an onward movement of a portion towards the ventricle. *c.* The systole of the ventricles immediately follows that of the auricles. Its duration is four or five times longer than that of the auricles; but it is a little shorter than the pause. When the contraction is at its height, the longitudinal and antero-posterior diameters of the heart sensibly diminish, though the lateral diameter increases, and the mass tends to assume a globular form. The base evidently descends, especially in front; but the apex remains nearly at the same level, merely describing a slight spiral movement, which turns the anterior surface to the right. The consistence of the heart increases with the commencement of the systole, and the finger impressing the ventricular substance is vigorously repelled. Longitudinal striæ appear on the surface of the heart in the direction of its superficial fibres, and become more and more distinct. The auriculo-ventricular valves raise themselves as soon as the contraction begins: their edges become opposed, and are slightly projected into the auricular cavities, their superior surface becoming multicurvate or dome-shaped, and roofing the ventricular cavity. The auriculo-ventricular orifices become somewhat narrowed. The flow of blood through the arterial orifices really produces the effect of recoil described by Gutbrod, and this again produces the above-mentioned descent of the base of the ventricles. The reason that the apex is less moveable than other parts of the heart is, that the movement impressed upon it by the recoil is neutralized by the shortening of the heart in its long diameter during its systole.

At the moment when the systole of the ventricle ceases, the auriculo-ventricular valves fall, and the orifices they guard become completely patent. The occlusion of the arterial orifices is effected by the application of the sigmoïd valves for a considerable breadth of their free border. At the same instant the base of the ventricular mass ascends, and the heart re-acquires its original form and flaccidity. In reference to the sounds of the heart, it is maintained that both are due to valvular tension alone—in the first sound of the auriculo-ventricular valves—and in the second, of the semilunar valves. The shock of the heart is synchronous with the ventricular systole, and is the result of the sudden augmentation of pressure, and the rigidity which is effected by the systole in the ventricular mass. It is perceived through the walls of the chest in consequence of the increase of the lateral or antero-posterior diameter of the heart during the period of contraction.

II. Nervous System.

1. J. M. Philipeaux and A. Vulpian, MM.: *Experimental Researches on the Effects obtained by the Reunion of the Divided Ends of Nerves possessing different Functions.* (M. Brown-Séquard's Journal de la Physiologie, 1863, No. 23, p. 421.)
2. Lussana, M. Ph.: *Experimental Researches on the Influence exerted by the Pneumogastric Nerves over the Effects produced by Poisons when introduced into the Stomach.* (Comptes Rendus de l'Académie des Sciences, 1864, vol. lviii. p. 325.)
3. J. Budge, Prof.: *Upon the Influence of the Nervous System upon the Movements of the Bladder.* (Zeitschrift für rationelle Medizin, Band xxi. Heft 1, 1864.)

4. F. Frankenhauser: *On the Motor Nerves of the Uterus.* (Jenaische Zeitschrift für Medizin und Naturwissenschaft, 1864, Band i. Heft 1, p. 35.)
5. Lussana, M. Ph.: *On the Functions of the Cerebellum.* (M. Brown-Séquard's Journal de la Physiologie, t. vi. No. 22. p. 169.)
6. Becker, Dr. Otto: *On the Functions of the Ciliary Processes of the Human Eye.* (Medizinische Jahrbücher of Braun and Duchek, 1864, Wien.)
7. Krause, M. Prof.: *Upon the Nerves Distributed to Glands.* (Zeitschrift für rationelle Medizin, Reihe iii. Band xxi. p. 90.)
8. J. Ranke: *Researches upon the Chemical Conditions of Exhausted Muscle.* (Reichert and Dubois-Reymond, Archiv, 1863, No. 4, p. 422.)

1. In the January number of this Journal for the present year an account was given of the observations on the effects of uniting the opposite ends of divided nerves possessing different functions, by MM. Gluge and Thiernesse. We now proceed to give the conclusions arrived at by MM. Philipeaux and Vulpian. Their experiments have been very numerous, and were chiefly made upon dogs, and they found that old animals bore the requisite operations better than young ones: 1. When the peripheric end of one nerve of mixed functions is joined to the central end of another mixed nerve, intimate union takes place between them. 2. A similar junction occurs when the central end of a sensitive nerve is placed in contact with the peripheric end of a motor nerve. 3. Under the influence of the anatomical and physiological conditions thus produced by the experiment, the peripheric end of the motor nerve, which in the first instance undergoes complete degeneration, becomes throughout its whole length completely regenerated; and 4. This takes place in old animals as well as in young ones, the only difference being that it is sometimes more rapid in the latter. 5. Whilst *autogenic* reparation of the peripheric end of a cut nerve—that is to say, the reparation which takes place in the peripheric end of a nerve allowed to lie loose in the tissues of the part—is ordinarily very imperfect, at least for several months, the regeneration of the peripheric portion of a nerve, when placed in apposition with the centric end of another nerve, is much more perfect, complete regeneration of all the nerve-tubules appearing to take place. It is also, 6, more rapid, even though it be a nerve of different functions. In young animals—for instance, in the former case—no attempt at regeneration can be observed after forty days, whilst in the latter it is very evident twenty-eight days after the operation; and in old animals the difference is still more marked. Hence it would appear that in the second case regeneration is hastened by an influence proceeding from the nervous centres. 7. The regenerating influence, probably emanating from the nervous centres, can therefore be transmitted to the peripheric end of one nerve by the centric end of another possessing different functions. 8. And it seems to be of no consequence whether this centrifugal influence passes through the centric end of a motor or of a sensory nerve. 9. When the union is perfect, and the regeneration of the peripheric end is sufficiently advanced, stimuli applied to one of the ends can be propagated through the junction to the other. 10. This effect can be most distinctly shown when the peripheric end is motor, for it is possible to excite contractions by the application of stimuli to the sensory nerve above the cicatrix in the muscles supplied by the peripheric extremity of the motor nerve. Strong contractions of the muscles of the tongue can thus be induced either upon mechanical or electrical excitation of the centric extremity of a pneumogastric or lingual nerve united to the peripheric extremity of a hypoglossal nerve. 11. By establishing a similar union between a cerebro-spinal and sympathetic nerve, movements can be excited in the parts supplied by the latter in consequence of irritation applied to the former. Thus galvanization of the peripheric end of the hypoglossal nerve, united by operation with the upper end of the cervical sympathetic

nerve, produces, when cicatrization is complete, all the effects upon the eye and pupil which characterize stimulation of the sympathetic itself. 12. The changes induced in any point of a nerve by the application of a stimulus can be clearly shown by experiment to be propagated centripetally as well as centrifugally, whatever may be the function of the nerve. 13. It is impossible therefore to attribute either motor or sensory properties to the nerves themselves. The nerves are motor or sensory not by virtue of any power inherent in themselves, but simply as the result of their centric and peripherical relations. They must be regarded as irritable or excitable cords capable of conducting irritation in one direction or the other, whatever may be their structure, and whether they belong to the nervous system of animal or of organic life.

2. It is well known that section of the pneumogastric nerves retards the effects produced by the introduction of strychnine into the stomach, whilst it promptly induces the poisonous results which result from the simultaneous presence of amygdaline and emulsine. M. Lussana's experiments were undertaken to explain the causes of this difference. The first series of researches tended to show that the diminished energy of strychnine was essentially attributable to the obstacles to its absorption, occasioned by the disturbances in the circulation and in the respiration consequent upon the operation. The second series were made to determine why hydrocyanic acid was not produced in the healthy stomach when emulsine and amygdaline were successively taken. Some have suggested that the gastric juice so modifies the emulsine, that it is unable to effect the decomposition of the amygdaline; but the experiments of M. Lussana invalidate this conclusion, since he finds that the gastric juice exerts no digestive operation on emulsine, nor in any way annuls its disintegrating power over amygdaline. Selmi has shown that amygdaline and emulsine yield a maximum quantity of hydrocyanic acid when they encounter in a neutral fluid, and a minimum quantity when the menstruum is acid. Herein is the true cause of their feeble action when introduced into the healthy stomach; the acid gastric juice effectually prevents the ordinary changes produced in the amygdaline by the emulsine, but the changes may still be brought about if the gastric fluid be rendered alkaline. Thus the rapidity and energy of the poisonous agency is very observable in herbivora and other animals possessing weak gastric juice, and hence serious effects follow the operation of dividing the pneumogastric nerves, because this operation effects for a time at least a diminution in the secretion of healthy acid gastric juice.

3. In a previous communication Budge showed that movements of the bladder could be produced by irritation applied to the medulla oblongata in various animals belonging to the mammalian class. The present essay gives the results he obtained from a more recent and extended series of observations. He believes he has satisfactorily established—(1.) That there is a special tract of nervous substance, which, commencing in the cerebral peduncles, and running downwards through the corpora restiformia, medulla oblongata, and anterior cords of the spinal cord, to its very extremity, possesses the power of inducing movements in the bladder. (2.) That motor fibres from this tract issue from the anterior roots of the 3rd and 4th sacral nerves, and proceed to the bladder. (3.) That a reflex motor impulse may be propagated by irritation applied to the sensory fibres entering the posterior roots of the 1st, 2nd, 3rd, and 4th sacral nerves; and (4.) That that portion of the spinal cord which is opposite the lower lumbar vertebræ includes a nervous centre, the irritation of which is constantly followed by movements of the bladder, and the excitability of which is more persistent than that of any other part of the spinal cord.

4. From a series of experiments performed on rabbits, Frankenhauser draws the following conclusions: (1.) The motor centre, on irritation of which movements are excited in the uterus, is seated in the cerebellum and medulla oblongata. (2.) From thence downwards contractions can be excited on appli-

cation of a stimulus to every part of the spinal cord, whether to its outer surface or to its internal portion; the excitation is in fact transmitted by the fibres connecting the cord with the sympathetic or the nervi uterini; for (3.) Irritation of the spinal cord below the 3rd or 4th lumbar vertebræ only occasions contraction if the connecting fibres with the sympathetic remain uninjured; whilst after ablation of the ganglion mesentericum and the aortic plexus no contractions of the uterus occur, but only of the bladder and rectum; moreover, upon irritation of the aortic plexus alone, active uterine contractions occur. (4.) The intermediate or co-ordinating centre of the uterine contractions is the inferior mesenteric ganglion. Movements are best excited by irritation applied to its afferent or efferent branches; when directly applied to the ganglion, perhaps on account of its thick investing membrane, they have little effect. 5. The plexus aorticus, when excited, induces contraction in the whole uterus, especially if the nervi spermatici are also stimulated; and by application of the stimulus to one side or the other of the aorta plexus, the corresponding side of the uterus is made to contract, the contraction subsequently spreading over the whole organ. Thus it appears that the plexus of the sympathetic nerve, distributed upon the walls of the aorta, is a motor centre for the uterus; its ganglia forming collectively the intermediate centre for motor excitations; whilst excitation of the nerves issuing from the sacrum, and proceeding to the uterus, induces no excitation, but even checks movement; hence he believes the sacral nerves are to be regarded as the channels for inhibitory action upon the uterus.

5. M. Lussana believes that the cerebellum is essentially the encephalic centre of "muscular sense," and of the sexual passion. The results of its irritation are usually vomiting, cephalalgia, convulsions, and affections of the pupil. In pathological cases vomiting occurred 28 times in 128 instances. He attributes the pain in the head commonly felt in disease of the cerebellum to irritation of the fifth pair of nerves, since its lesion in animals never produces any symptom of pain. In like manner, he attributes the hemiplegia occurring in disease to pressure produced on other parts, as the pons. He thinks, however, that an anæsthetic condition of the muscles has been mistaken for paralysis. Lussana has observed in fishes and birds remarkable spasmodic rotatory movements in the globes of the eyes after removal of the cerebellum, and refers to the amblyopia, strabismus and mydriasis which occur in the human subject as indicative of a connexion between the cerebellum and the visual sense, by which it is enabled to fulfil its proper function as an organ and centre for the "muscular sense." Nor are these movements of the eyes the only evidence of its connexion with the organs of special sense, since Foville has indicated its connexion with the vestibular branch of the auditory nerve, and also with the fifth nerve, which two nerves, indeed, he has termed the "cerebellar nerves." The relation of the sense of hearing with muscular movements is generally admitted; and the fifth nerve is particularly characterized by its distribution to the muscles of the head. He believes that no case has hitherto been observed in which there was extensive disease of the cerebellum without concurrent symptoms of disorder of muscular movements; and in the numerous pathological cases, the accounts of which he has investigated, there have been uniformly some symptoms which could be directly attributed to defect or absence of the muscular sense. As regards the question of the cerebellum being the centre for the sexual passion, he observes that he does not agree with M. Brown-Séquard in considering that disordered states of this desire are attributable to irritation, for he has met with a case of complete sexual apathy, in which the cerebellum was partly wanting, and has observed that venereal abuses are followed by vertigo, and that in women hysteria produces paralysis of the muscular sensibility.

6. Becker believes the following statement includes all the positive facts known in regard to the mode in which the accommodation of the eye is affected.

When the eye is accommodated for its far point, it is at rest: that is, neither the whole nor any part of the ciliary muscle is in contraction; the muscular fibres of the iris are in a state of eqnipoise, the degree of dilatation being dependent upon the varying tonic excitation of the two muscles. When the dioptric apparatus of the eye is accommodated for near objects, the whole of the ciliary muscle (including both its circular and radiating fibres) contracts, together with the sphincter, and perhaps also the dilatator pupillæ. When the dioptric apparatus is accommodated for very distant objects, the ciliary muscle relaxes, and the *dilatator pupillæ* contracts with coëtaneous elongation of the sphincter (or perhaps the latter simply relaxes, giving a preponderance to the contracting dilatator). By the contraction of the ciliary muscle its anterior termination and the peripheric portion of the iris connected with it are carried backwards and inwards; its posterior, more external extremity, and the portions of choroïd and retina attached to it, are on the contrary carried forwards, and the inner angle of the muscle, which is triangular on section, presses inwards during contraction—that is, it approximates the axis of the eye. Whilst the iris in its peripheral part is drawn inwards and backwards, the pupillary part moves forwards; and the ciliary processes diminishing in thickness and in length, draw back against the ciliary body. These changes in the ciliary bodies and the iris are accompanied by changes in the lens, which consist in its anterior surface becoming more convex, and approximating the cornea, whilst the posterior surface retains its place and scarcely alters its curvature, so that the axis of the lens (its antero-posterior diameter) becomes longer, and its transverse diameter less. There are grounds for believing that this change in the figure of the lens is occasioned by the contraction of the ciliary muscle, relaxing the zonule of Zinn, so that the posterior external angle of the zonule moves forwards, and the internal angle inwards. In proportion to the relaxation of the zonule, the lens, previously flattened by the pressure exerted by the tense zonula, attains its condition of rest. When the ciliary muscle ceases to contract, its inner angle moves outwards, its posterior angle backwards; the zonula again becomes tense, its reaction on the lens greater, and the lens flatter; the iris again moves forward at its periphery, its pupillary portion is, with the anterior surface of the lens, moved backwards, and the ciliary processes swell up and project themselves between the lens and the iris, inwards and forwards in the posterior chamber of the eye. The movements of the ciliary muscle and of the iris are associated movements, and act synergetically; but the iris exerts no direct influence on the form and movements of the lens, as is clearly shown by the fact that these occur when the iris is absent. On the other hand, the movements of the ciliary processes depend upon the play of the iris and upon the contractions of the ciliary muscle. With deficient iris, consequently, the ciliary processes no longer change their form or position.

7. According to Krause, there are various glands possessing ducts which only furnish an abundant supply of their secretion when certain nerves are stimulated; snch are the salivary and lachrymal glands, which not only resemble one another in all the particulars of their general structure, but also agree in the remarkable point that their nerves are derived from two sources. Those which act directly on the salivary glands rnn in the third division of the fifth pair—that is to say, in the chorda tympani, and receive at various places communicating branches from the sympatheticganglia or plexuses. Those intended for the lachrymal glands proceed from the ganglion ciliare. In both sets of glands plexuses may be seen, consisting of the pale fibres of Remak accompanying the arteries even to their smallest branches. With these are some fine nerves possessing a double contour and probably sensory properties. The larger trunks of those nerves that act directly on the gland, are usually found forming wide-meshed plexus, in close proximity with the ducts of the gland. The ducts are usually composed of loose connective tissue

with longitudinally or transversely arranged elastic tissue, in greater or less abundance. Smooth muscular tissue is rarely or never discoverable in man, except in Wharton's duct, in which all recent observers have noticed its presence. Hence it would appear that agents or stimuli leading to the increased discharge of secretion, act, not on the ducts of the glands, but on the ultimate secreting vesicles of the gland itself. In the dog and hedgehog, whilst the nerves are yet lying on the ducts of the salivary glands, before reaching the glandular substance, ganglion cells are now and then distributed amongst the fibres. In the gland substance the nerves divide and anastomose, and the number of ganglion cells is very great. On the chief duct, or on its first branches, a large ganglion is often to be found, the cells of which amounting to several hundreds are connected on either side with fibres, two or three cells often intervening between an inferent and an efferent fibre. Numerous smaller ganglia of fusiform or spherical shape are scattered through the substance of the gland, making these structures amongst the most richly supplied with nerves of all in the body. Krause reserves the description of the mode of termination of these nerves for another communication.

8. Ranke arrives at the following conclusions:

(1.) The removal of the blood contained in muscles of frogs, exhausted by tetanization, enables them again to respond to stimuli. This effect is produced by simply making an opening in the veins, but still more efficiently by injecting or washing out the vessels of the muscles with a five per cent. solution of common salt. This holds good alike for the tetanus induced by electricity and that occasioned by strychnine.

(2.) The blood, *per se*, exerts no exhaustive power on muscle; on the contrary, the presence of blood in normal quantity confers its vital properties on muscular tissue. Coetaneously, therefore, with the removal of the blood by injections in tetanized muscles, some material must be washed out which acts injuriously on the properties of the muscular tissue.

(3.) The artificial injection of fluid containing the products of disintegration obtained from a muscle in a tetanic state, as the juice of flesh obtained at a temperature of 45° C., and the necessary amount of salt, causes immediate diminution of contractile power; or, in other words, produces the effects of complete exhaustion in the muscle. As in the case of exhaustion produced in the ordinary way, with the diminution of contractile power, there is increased irritability of the muscle; but upon again washing out the injected fluids the muscle regains its normal and original powers.

(4.) Injections of lactic acid induce precisely the same results as injections of the juice of flesh; and this acid has been shown to be present in tetanized muscle by Du Bois-Reymond.

(5.) Injection of carbonate of soda lowers the contractile power of muscle, and ultimately entirely abrogates it.

(6.) Muscles freed from blood in otherwise uninjured animals recover by themselves both after electrical and artificially induced (as by injections) exhaustion, and this is attributable to the presence of the alkaline lymph. If this be removed by prolonged washing out as far as possible, the spontaneous recovery sinks to a minimum, or is altogether absent. The restoration of contracted power produced by the injection of carbonate of soda, though this salt is itself a depressant of muscular activity, is probably due to its combining with and neutralizing the lactic acid.

From hence it appears that the spent (tired) muscle is not in a state of exhaustion—using that term in a strict sense—it still possesses in itself the conditions for developing force. Its incapacity for exertion results not from a deficiency, but from a superfluity of material. A supply of nutritive material is thus not primarily requisite to give it energy, but all that is required is the removal or the neutralization of the products of its disintegration.

Ranke denies that ligature of the abdominal aorta in warm-blooded animals causes a condition of the muscle precisely similar to rigor mortis, as was stated by Stannius, although they may be unexcitable through the nerves; this effect being due to the accumulation of CO_2 acting as a paralysing agent upon the nerves. He found that the muscles present before aud after the ligature of the arteries no difference in their excitability or power of contraction. Ligature of the abdominal aorta, followed by tetanization and injection of a dilute solution of NaCl, restored the contractility of the muscle; but Ranke was unable to produce this effect in muscles which had passed into the state of rigor mortis.

III. Generation and Development.

M. Ch. Robin: *On the Development of the Atlas and Axis.* (M. Robin's Journal de l'Anatomie, vol. i. 1864, No. 3. p. 274—299.)

M. Robin states that in the embryos of mammalia, when they have attained the length of from four to six mm., the cartilage of the bodies of three or four dorsal vertebræ are seen to envelop the notochord, their number increasing up to twenty-four, the sacral and coccygeal being developed at a later period. These cartilages are separated from one another by regular, at first somewhat more clear and narrower, spaces representing the bodies of the vertebræ; the proper tissue of the intervertebral disks begins to be formed a few days subsequently, and is, like the cartilages themselves, traversed by the notochord. Still later, but some time before the appearance of the first points of ossification in the thoracic vertebræ, the notochord thickens or dilates regularly in the form of ovoïd, fusiform, or lenticular varicosities at the centre of each intervertebral disk. The cartilage is everywhere developed before the substance of the brain and spinal cord. Each cartilage is developed from the first as a perfect circle, and not as two halves. At first it surrounds the notochord with a layer of equal thickness all round, but subsequently it becomes thicker posteriorly. The appearance of quadrilateral plates is an optical illusion. The bodies of the vertebræ are the first cartilages which make their appearance. In young guinea-pigs there is a simultaneous production of ovoïd nuclei and of an interposed hyaline amorphous substance. The consistence of the cartilage is at first soft and friable, and it is composed of nuclei closely approximated, but it soon gains consistence and becomes more transparent, the nuclei separating from one another by reason of the increase of hyaline substance. The lateral masses now make their appearance in pairs, and join themselves to the central mass by the development of the pedicle. The lateral masses then push out the laminæ behind, and at a much later period these unite to form the spinous process, which is the last part formed in each vertebra. The cartilages of the ribs do not develop at once in their whole length, but gradually from the spine towards the sternum, and in human embryos of one inch in length the posterior halves may be distinctly seen under the microscope, clear, transparent, and cartilaginous, whilst anteriorly they are opaque, composed only of granular nuclei with a little intervening matrix. The early cartilaginous condition of the bones of the extremities is similar to that of the vertebræ, presenting numerous nuclei in close apposition, which subsequently become separated by the development of clear hyaline substance. It is also observed that the cavities containing the nuclei increase in size, so that the nuclei are separated by a space from the inner surface of the cavity. As regards the development of the atlas and axis, he observes that the body of the axis commences by two small cartilaginous masses, which may very clearly be seen when a young mammifer—as, for instance, a guinea-pig—attains a length of half an inch. The posterior part towards the tail resembles the body of the third cervical vertebra; the anterior, towards the head, is somewhat longer, conical, and traversed throughout its whole length by the notochord, which may very readily be seen; the two pieces are in contact, but may easily be separated by pressure, and a well-marked fissure renders the division between them very distinct; the upper or odontoïd piece unites with the lower piece, which represents the body of the second vertebra, while both are yet cartilaginous. In man, this takes place when the lateral masses become blended with the centrum, or when the body of the embryo is about fourteen or fifteen mm. in length. A slight dilatation of the notochord occurs between the two portions of the atlas, as elsewhere between adjoining vertebræ. The remains of the passage of the notochord through the odontoïd process may be observed as late as the second year after birth. The cartilage constituting the odontoïd process of the axis represents for a time the body of the atlas. The anterior arch of the atlas is formed in a different way, for at the epoch at which the lateral masses of the atlas are developed these send down an inferior (or anterior) prolongation on each side, which unite in the middle line to form the anterior arch of that vertebra. This anterior arch is not produced in all animals; it is absent in the kangaroo, and again in some animals, as the crocodile, the "odontoïd portion" does not become blended with the axis. That the odontoïd process is in reality homologous with the body of a vertebra, and that the anterior arch of the atlas is not, is further shown by the fact that the former is, and the latter is not, traversed by the notochord. The ossification of the cartilages of the vertebræ commences with those of the last dorsal, extending itself forwards and backwards through the other vertebræ in a somewhat different manner in different animals. In man it commences in the lateral masses, and even extends throughout them, before it appears in the centre of the several vertebræ. In the atlas, the posterior arch ossifies first about the fifth month of fœtal life. The anterior arch remains long cartilaginous, one, or frequently two, points of ossification appearing at the fourth or sixth month after birth. The osseous centre of the bodies of the vertebra is situated a little behind the position of the notochord in the substance of the cartilage; it rapidly extends, and is soon traversed by one or two vascular channels. The osseous point of the proper centre of the axis resembles that of the other vertebræ; is always, like them, single. It first appears about the middle of the fourth month of fœtal life. The odontoïd process begins to ossify at about five months and a half. It is single, and situated a little behind the notochord. At its upper extremity the point of ossification is bilobed.

HALF-YEARLY REPORT ON MATERIA MEDICA AND THERAPEUTICS.

By Robert Hunter Semple, M.D.

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I. *On the Employment of Local Injections in Neuralgia, Paralysis, and other Affections.* (Journal de Médecine et de Chirurgie Pratiques, November, 1863.)

Professor Courty, of Montpellier, has published a note on the efficacy of local injections of strychnia in the treatment of paralysis of the facial nerve. He injected a few drops of a solution of this alkaloïd along the course of the facial nerve, between its exit by the stylo-mastoïd foramen and its passage to the neck of the condyle of the lower jaw. The injectiou was repeated every two or three days, and three injections at the least, and six at the most, sufficed to remove entirely, in the space of from ten to fifteen days, every trace of paralysis in all the muscles of the face. The patients were a man aged fifty-six, a lady of twenty-five, and a young woman of twenty-two. In all three cases the cure was complete. M. Courty has also recorded a case of paralysis which lasted for a year, and had been ineffectually treated by various remedies, but which was cured by a few injections of strychnia, performed over the inferior extremity of the spinal cord. M. Luton, of Rheims, has also called attention to the use of local injections in various maladies. He has successfully employed a more or less concentrated solution of nitrate of silver in 12 cases of sciatic neuralgia, 2 cases of intercostal neuralgia, 3 of coxal neuralgia, &c. M. Luton has also mentioned a curious case of sub-orbital neuralgia removed by three injections of salt water. He has three times employed injections of tincture of iodine in parenchymatous goîtres; one case was cured, the other two were still under treatment at the date of the report. The applications of which this new plan is susceptible are very numerous, and may include the use of bichloride of mercury, arsenious acid, sulphate of copper, sulphate of zinc, and any other irritating substance which acts in the interior of the tissues in the same manner as one which is applied on their surface.

II. *On the Construction of Uterine Tents from the Dried Stem of the Laminaria Digitata, or Sea-tangle.* By J. G. Wilson, M.D., Lecturer on Midwifery, Glasgow. (Medical Times and Gazette, Nov. 28, 1863.)

The *Laminaria digitata* is a well-known sea-weed found in great abundance on rocks and reefs throughout the globe. The stem is of a cylindrical form, gradually tapering upwards, of a soft, firm, tenacious, and flexible consistence, becoming hard and horny, and greatly reduced in diameter when dry. It possesses the remarkable property of again expanding when exposed to moisture, and from this character, Dr. Sloan, of Ayr, directed the attention of the profession to its probable use as a substitute for ordinary tents in surgical practice. A portion of the dried stem will, in the course of about twenty-four hours, by the absorption of moisture, attain its full original size—that is to say, it will expand to three or four times the diameter it presented in the dried condition. The secretions of the mucous membrane in and around the cervix uteri will afford sufficient moisture for the expansion of the tent, and if the secretions should be deficient, a small quantity of tepid water may be injected. Dr. Wilson finds that the tangle in its young and recent condition is in the best state for making tents, as it expands more readily and more largely in proportion to its size than when of older material, but, on the other hand, the older tangle exerts a more powerful dilating effect. In all cases where it is considered necessary to open up and dilate the os and cervix uteri, Dr. Wilson thinks that these tangle tents will be brought into use. They are firmer and less bulky than those made of sponge, and can be more easily introduced; and, indeed, in those cases where the os and cavity of the cervix uteri are very small, they may be introduced when sponge tents cannot.

III. *On the Therapeutical Applications of the Calabar Bean.* By Mr. Thomas Nunneley. (Lancet, July 18, and Nov. 28, 1863.)

There is no reason to doubt the energetic local action of the Calabar bean upon the pupil, and there is no other substance known which contracts that aperture so quickly and painlessly. In all cases where the pupil is preternaturally dilated, and it is thought desirable to contract it, preparations of this seed may be employed without hesitation. But the number of cases in which it is desirable to contract the pupil, is not very large, and hence the application of the bean in practice must be rather limited. Its chief value consists in its contracting the pupil so as to withdraw a prolapsed iris when it has escaped through a wound of the cornea, and Mr. Nunneley, in the 'Lancet' for July 18, 1863, has related two cases in which he had thus employed it. In such cases it will probably be of great value, and will save many eyes which otherwise would be altogether lost or comparatively useless, and in a great number of cases will convert what hitherto has been a prolonged, painful, and very troublesome affection, into a shorter and much more manageable one. It seems also probable to Mr. Nunneley, that it will be useful in those annoying cases in which, after extraction of the lens the iris prolapses, and will not remain out of the lips of the corneal wound. A case recently occurred, when Mr. Nunneley was performing the operation for extraction on an excitable woman, that she jumped up and could not be restrained; the knife was therefore withdrawn, and the iris prolapsed. A portion of Squire's paper (prepared with the Calabar bean) was immediately introduced under the eyelid, and the woman was placed in bed. On the following day the wound had healed, the pupil being as round, and the iris as natural as it ever was. In granular and irritable lids, in strumous ophthalmia where there is much photophobia, in some of the active inflammatory affections of the conjunctiva where there is much pain and excitement, and where the contractile effect on the iris will not be objectionable, and possibly also in pure and uncomplicated retinitis, where contraction of the pupil would be useful by excluding the light, a lotion of the extract of the bean may be valuable; but Mr. Nunneley has not yet put it to the proof in these and similar affections. With regard to the mode of using the bean, the watery infusions and extracts will not keep, and are not so active as the spirituous preparations, and they are therefore not likely to be so much employed. The principal objection to paper saturated with a solution of the bean now so well known, Mr. Nunneley thinks, is, that in some eyes it acts as a foreign substance,* causes a copious flow of tears, and then it washes out; but still he has known it remain in its place for fourteen days, and in one case for twenty-one days. Mr. Squire has prepared a tincture, which Mr. Nunneley considers an elegant and persistent preparation, but requires dilution lest the spirit should prove injurious. One drop to ten drops of water will act efficiently in many cases. Mr. Nunneley relates a case which lately occurred to him, of a child three weeks old, who had been suffering from acute purulent ophthalmia from within a few days after birth, and in whom a considerable part of both corneæ were in a state of slough, through which a very large portion of the irides prolapsed. A solution of the spirit extract of the Calabar bean was put into both eyes night and morning for two days, when the prolapsed portions had greatly receded. The case was still in progress at the date of Mr. Nunneley's paper.

IV. *On the Active Principle of the Calabar Bean.* (Bulletin Général de Thérapeutique, Feb. 29, 1864.)

The active properties possessed by the *Physostigma Venenosum*, or Calabar bean, have led chemists to suppose that these seeds owed their characters to the presence of an alkaloïd even more powerful than strychnia; and in fact, MM. Jobst and Hesse, of Stuttgard, have discovered an alkaloïd which they

* Since Mr. Nunneley's communication to the 'Lancet,' gelatine paper saturated with the Calabar bean solution has been adopted with advantage instead of ordinary paper.

call *physostigmine.* According to their researches, the active principle of the seeds resides only in the cotyledons. They obtained it by treating the beans with alcohol, and then taking up with ether the residue remaining after the evaporation of the alcoholic solution. The ethereal solution, afterwards evaporated, left pure *physostigmine,* or as some have proposed to call it, *Kalabarine.* The alkaloïd appears as an amorphous brownish-yellow mass, and is at first separated under the form of oily drops. It is readily soluble in ammonia, caustic and carbonated soda, ether, benzine and alcohol, but less soluble in cold water. It is entirely precipitated from its ethereal solution by animal charcoal. The aqueous solution has a slightly burning taste, a decided alkaline reaction, and gives an abundant reddish-brown precipitate with iodide of potassium, and a precipitate of hydrated oxide of iron with a solution of chloride of iron; and fused with hydrate of potash, it disengages vapours which have a strongly alkaline reaction. Acids dissolve it easily, giving rise to solutions of salts which generally present a dark-red colour, and more rarely a dark-blue. The hydrochlorate of physostigmine gives whitish-red precipitates with tannin; pale yellow with chloride of platinum; bluish with chloride of gold, the metal being reduced; and reddish-white with bichloride of mercury. Twenty-one beans yielded only a small quantity of alkaloïd.

Two drops of a watery solution of the alkaloïd, placed upon the eye, caused contraction of the pupil, at the end of ten minutes, to about a twentieth of its primitive diameter; the pupil remained in this state about an hour, and at the end of from four to six hours it resumed its original dimensions. Taken internally, physostigmine is as poisonous as the most dangerous cyanides. A quantity of the alkaloïd corresponding to one bean having been administered to a rabbit, at the end of five minutes the animal fell down, remained motionless, and died twenty-five minutes afterwards, or about half an hour after having swallowed the poison.

Physostigmine causes contraction of the pupil even in the eye of an animal which has been dead for some time. Two drops of the watery solution having been placed upon the eye of a rabbit an hour after it had been killed by mechanical means, it was ascertained that the pupil was contracted by one quarter as compared with the opposite eye. A rabbit killed by physostigmine did not present this phenomenon; but it was ascertained to occur in a slight degree in another animal poisoned by cyanide of potassium. Hence it appears that the muscles, even after death, are still susceptible of being influenced specifically, not only by the galvanic current, but also by physostigmine.

V. *Evidence against the Internal Use of Mercury in Syphilis and other Diseases.* By Dr. Charles Drysdale. (Med. Circular, Dec. 2, 1863.)

In a paper read at the Harveian Society of London, Dr. Drysdale has collected a great mass of evidence against the internal administration of mercury, and his statistics and conclusions are brought forward to support the assertion that this metal does more harm than good to the patients for whom it is prescribed. By quotations from Skey, Desruelles, Copeland, and others, he shows that mercury possesses the physiological property, when given to dogs, of producing caries of bones and complete degradation of the animal frame. Dr. Drysdale contends that the only property which mercury is proved to possess is its power as a purge, but that it is a bad purge; and although it is called a cholagogue, recent experiments have shown that it actually diminishes the secretion of bile. In iritis, mercury has been shown to be useless and probably injurious by Carmichael, by Dr. H. Williams of Boston, Dr. Hughes Bennett, and Mr. Z. Laurence. Dr. H. Bennett also condemns the use of mercury in inflammatory diseases of the lungs, and Dr. Walshe entertains the same views. With regard to syphilis, in which mercury has long been considered a specific, Dr. Drysdale quotes Dr. Wm. Fergusson, who showed, in his experience from 1812 to 1846, how many thousands of the British army had recovered from primary and secondary syphilis without a partice of mercury; and on the other hand, how the British army suffered in the Peninsula from the mercurial treatment. Mr. Guthrie had declared that all sores on the penis, whether indurated or not, will recover perfectly under rest, diet, and cleanliness, without mercury. Out of 407 cases treated by Hennen, iritis occurred only in one; in 1818, Dr. John Thomson had treated a large number of troops in Edinburgh for venereal disease without mercury, and they all recovered; Dr. Desruelles mentions that in 1841 300,000 cases of venereal disease, treated without mercury, had been recorded. Dr. Fricke had treated in the Hamburgh Hospital, from 1824 to 1844, 15,000 cases of venereal disease, and his experience is strongly against the use of mercury. The experience of the Swedish government from 1822 to 1836, during which time 46,687 cases were treated, has shown that the non-mercurial treatment is infinitely the more successful. The French Council of Health have shown that of 5271 cases treated without mercury, no case of caries occurred, and only two of exostosis. Mr. Syme considers that syphilis consists of the primary ulcer, sometimes followed by sore-throat and slight, though sometimes tedious eruptions, but never by bone disease or any very bad symptoms when mercury is not used. Dr. Hughes Bennett says that the idea of mercury being an antidote for the syphilitic poison, and the incalculable mischief it has caused, will constitute a curious episode in the history of medicine at some future day. With regard to infantile syphilis, Dr. Drysdale observes—1. That he believes this condition in infants is frequently caused by the poisoning of the parents by mercurio-syphilitic disease; and 2. That infantile syphilis is far more successfully treated without mercury than with it.

It must be observed that in the discussion which followed the reading of Dr. Drysdale's paper, several speakers supported the sentiments he had expressed, but others agreed with him only to a limited extent. More recently, many distinguished physicians and surgeons have combated Dr. Drysdale's views.

VI. *On the Internal Employment of Essence of Turpentine in the Head-aches of Nervous Women.* By Professor Teissier, of Lyons. (Gazette Médicale de Lyon, January, 1864.)

M. Teissier thus describes the kind of cases of nervous head-ache in which he has found the essence of turpentine to be beneficial. The affection, he says, is a common, but often very severe one, and should not be confounded with ordinary neuralgia, either periodic or irregular, of the face or cranium, or even with hemicrania. This cephalæa is characterized by a much more fixed and continuous pain in the head, and may last not only several weeks, but months, and entire years, without presenting more than rare and slight intermissions. The pain is sometimes dull, sometimes shooting, and sometimes pulsative, occupying only a single point of the head or the whole of the cranium, being accompanied by nausea or even vomiting, and complicated besides with much more serious symptoms, such as vertigo and tendency to syncope, inability to think or to work, despondency, weariness of life, and sometimes numbness in the limbs. It is especially observed in nervous women, with exalted sensibility, of a delicate constitution, somewhat anæmic, and especially hysterical. It often co-exists with dysmenorrhœa, amenorrhœa, and also with a tendency to excessive menstruation, although it is sometimes observed in persons of good constitution whose menses are regular. M. Teissier observes that many remedies already exist which are efficacious in this complaint, such as valerian, assafœtida, the ethers, cyanide of potassium, aconite, &c.; and more particularly those which improve the blood, as chalybeate medicines, and different mineral waters. But these means sometimes fail, and then the essence of turpentine may be employed with advantage; although M. Teissier does not assert that it is infallible in its operation. It has been employed in the same kind of cases by Dr. Graves and by Trousseau; but M. Teissier does not think it necessary to prescribe it in such large doses as those physicians have done. He recommends its use in capsules, given at meal-times, each capsule containing eight drops of the essence.

VII. *On the Local Application of Chloroform in Neuralgia and Muscular Rheumatism.* By Dr. Dupuy de Frenelle. (Journal de Médecine et de Chirurgie Pratiques, March, 1864.)

Dr. Dupuy maintains that idiopathic neuralgia and muscular rheumatism are two varieties of the same disease, the nerves of common sensation being equally affected in both, and the causes of both being the same. The treatment by chloroform is not new; but Dr. Dupuy contends that no one has previously employed it in the same manner as himself, except the late Dr. Aran. Dr. Dupuy states that he has discovered the means of inducing every variety of local irritation by the contact of chloroform, from simple rubefaction to vesication, the revulsive action being necessary to the success of the plan, which is described as follows: The middle of a piece of fine and well-worn linen is introduced as a stopper into a phial of pure chloroform, which is inverted so as to impregnate with the fluid a more or less considerable portion of the compress, according to the extent of the skin to be acted on; the linen is then laid over the seat of pain, and with the palm of the hand is kept in close contact with the skin; but when the pain is limited to one spot, as in some cases of intercostal, facial, supra-orbital, or auricular neuralgia, the pressure of the thumb or forefinger is sufficient. Several successive applications should be made at once when the pain occupies more than one region, or when it exists along the entire course of a nerve, as in sciatica. In the latter case, the chloroform should be applied over the ischiatic notch, the head of the fibula, or the external malleolus, from the origin of the nerve to its termination. Dr. Dupuy brings forward in support of his practice a hundred and fifty cases, in which the largest number of applications of chloroform was twelve, and this number he has never exceeded.

VIII. *On the Operation of Astringents on the Urinary Organs.* By Professor F. Mosler and W. Mettenheimer, junr., of Giessen. (Schmidt's Jahrbücher der in und Ausländischen Gesammten Medicin, January, 1864.)

Lewald has proved that small quantities of acetate of lead, given in Bright's disease, diminished the excretion of albumen by the kidneys; and he conjectured that in a healthy condition of those organs the quantity and constitution of the urine were changed by the use of lead. The observations of Mosler and Mettenheimer, made to determine this point, were conducted in the case of a person of twenty-six years of age, suffering from a somewhat advanced state of tuberculosis, for the arrest of which the acetate of lead had been administered. The functions of the kidney were normal, and the mode of living and the diet were carefully regulated and watched, and the proportion of urine and fæces was accurately ascertained every twenty-four hours. The period of the experiments was divided into five sections—namely, 1. Eight days of observation without the employment of any medicine. 2. Eight days during which 3 grains of acetate of lead were administered three times daily, and reaching 72 grains altogether. 3. Eight days during which 3 grains of acetate of lead were given four times daily, amounting altogether to 96 grains. 4. Five days, during which 3 grains of acetate of lead were given six times daily, amounting to 90 grains altogether; and 5. Eight days without any medicine. The following were the results of the experiments: 1. The weight of the body was not particularly reduced until the middle of the fourth period, when there was a diminution amounting to five or six pounds, probably owing, however, to an affection of the stomach, for the weight again increased when this affection was removed. 2. From the results of the experiments, it appeared that the acetate of lead limits the excretion of urine, even under normal conditions. In the first period, the quantity of this fluid amounted to 2128 cubic centimètres; in the second to 1805; in the third to 1979, and in the fourth to 1750. It is probable that this result is to be attributed to the astringent operation of the lead upon the vessels. 3. As to the influence of lead upon the specific gravity, the reaction, and the colour of the urine, the reaction remained always acid, the colour varied from yellow to reddish-yellow, and yellowish-red, and lastly to brownish-red, and the excretion of the solid constituents of the urine was diminished during the employment of the lead. 4. The excretion of urea was diminished during the use of the lead, reaching in the first period 39,941 grammes, in the third period 25,877, and in the fourth 24,308. The urea appeared to diminish in exact proportion to the quantity of lead administered. 5. The chloride of sodium and the sulphuric acid of the urine were diminished during the use of the lead, and in exact proportion to the greatest dose of the drug; but the proportion of sulphur was relatively more diminished than that of the chloride of sodium. Mosler and Mettenheimer propose the question as to the dose of lead which may be taken without injury. It is a well-established fact that large doses, not too long continued, are much less injurious than a longer use of small doses, and also that one individual is more liable to poisoning than another. In the case recorded, no remarkable disturbance was caused during the lead-treatment; but after the administration of 240 grains, appearances of poisoning were developed, and attained a rather high degree. They gradually disappeared, but less from the application of the usual antidotes than from the employment of abundant injections of warm water. The proportion of urine was during this time very much reduced. It may be remarked that the employment of the lead exercised a very favourable influence upon the tubercular affection.

IX. *On the Chemical, Physiological, and Therapeutical Properties of Iodoform.* By Dr. J. Righini. (Schmidt's Jahrbücher der in-und Ausländischen Gesammten Medicin, December, 1863.)

Dr. Righini's researches in relation to iodoform have shown that this substance is superior to the other preparations of iodine, in possessing anæsthetic as well as antiseptic and antimiasmatic properties. Morétin and Humbert, as well as A. Maître, have proved that iodoform may, in consequence of the large proportion of iodine which it contains, be substituted for the other preparations of iodine, as well as for iodine itself, in all the cases where this medicine is indicated; and they have also shown that the therapeutical application of iodoform possesses the advantage over the other preparations of iodine in not causing either the local irritation or the other unfavourable symptoms which sometimes necessitate the discontinuance of this drug. Iodoform, in its chemical relations, resembles chloroform, being a teriodide of formyle, and it is prepared by the mutual action upon one another of iodine, alcohol, carbonate of soda, and water. It forms bright yellow, friable, soft scales of a slightly pungent taste, and having a smell of garlic. It evaporates in the air in small quantities at a low temperature, and sublimes at a higher one; and at 120° the vapour is decomposed into carbon, hydriodic acid, and iodine. It is very slightly soluble in water, but is easily dissolved in alcohol and ethereal oil.

A series of experiments was instituted to ascertain the presence of iodine with animal fluids and the excretions of persons who had been treated with iodoform. It was found in the blood of a woman who had been successfully treated for a swelling of the thyroïd gland, followed by acute inflammation, and in the saliva and the sweat of several persons who had taken iodoform. It was discovered in the milk of nurses who had had iodoform administered for the purpose of acting therapeutically upon their scrofulous and rachitic nurslings. It was also found in the tears, the mucus of the nose, the menstrual blood, and in the urine, and even in the bile, the fæces, and the liquor amnii. By the administration of iodoform internally, an increase of the secretions of the liver and pancreas was observed, and still more of the secretions of the salivary glands and the kidneys. Emaciation was never observed, but, on the contrary, a slight increase of the deposition of fat. The tongue and œsophagus were not irritated by iodoform, and the mammary glands were not made sensitive and painful, as in the employment of iodide of potassium or iodine itself.

Iodoform may be given without danger in doses amounting to three grammes daily; but after very large doses Maître observed appearances of iodism. In the lower animals it is poisonous in large doses. When employed internally, iodoform combines partly with the proteinaceous substances to form soluble albuminates, which are easily absorbed, and partly with starch, if the latter is used with food, to form iodide of starch, under the influence of the gastric juice, and probably to be expelled undigested with the fæces.

A long list of diseases is given in which iodoform is said to have been administered with advantage, as tubercle, scrofula, disorders of menstruation, tumours, stoppage of the secretions in the uterus and the breasts, impotence, ozæna, ophthalmic blennorrhœa, obstinate exanthems, periostitis, tuberculous affections of the skin and mucous membranes, deep ulcerations, &c. It is also stated that iodoform in solution in alcohol is used with advantage externally in chronic neuralgia, lumbago, and rheumatism. Suppositories are recommended containing oil of cacao and iodoform. Iodoform cigarettes, made of belladonna leaves and iodoform are also described, together with liniments, salves, and gargles, in which this substance forms a constituent.

X. *On the Febrifuge Properties of the Common White Willow.* By Dr. Cazin. (La France Médicale, 1864.)

It has long been known that the white willow and its alkaloïd, salicine, possess febrifuge properties, and the fortunate coincidence has often been remarked of the growth of the willow in those very localities where intermittent fevers prevail—namely, in low, marshy situations. Dr. Cazin remarks, that if the willow has failed to exert a febrifuge action in all cases, the circumstance is due to the smallness of the dose employed, and he suggests that the remedy should be associated with other bitter and aromatic vegetable extracts. M. Cazin has been in the habit of treating in this manner for the last twenty years the intermittent fever which prevails among the inhabitants of the marshy grounds about Calais; and he has found the willow an efficient substitute for cinchona and quinine. In the early stage he recommends an emetic or aperient when gastric disturbance is present, and then he prescribes large doses of the bark of the white willow, alone or in combination with camomile, wormwood, and some other indigenous tonics, alteratives, and aromatics. He considers that the combinations of vegetable bitters with astringent and aromatic substances are far more efficient than the indigenous febrifuges administered alone. He also thinks it desirable to persevere for a week or ten days in the treatment after the removal of the paroxysms, and to prescribe a large dose every week for a month or longer, if any symptoms indicate the danger of a relapse. M. Cazin recommends the willow bark to be employed in a decoction (℥ss to ℥j in a pint of water) or in powder in the dose of ʒij to ℥j, in wine or beer, or in the form of a tincture or extract.

XI. *On the Therapeutical Applications of the Solution of the Permanganate of Potash and of Ozone.* By Samuel Jackson, M.D., of the University of Pennsylvania. (The American Journal of the Medical Sciences, January, 1864.)

Dr. Jackson having ascertained that the disinfecting and deodorizing properties of the solution of permanganate of potash had been established, determined to test its therapeutical action and practical application. He found, by experiments on himself, that the solution had no proper taste, but gave a sensation of coolness in the mouth, leaving behind a slight styptic feeling and dryness, which continued for an hour or more. When taken in the dose of a teaspoonful, slightly diluted, two or three times a day, it caused no inconvenience, but it was somewhat diuretic, and increased the appetite. He prescribed the solution in a case of dyspepsia, attended with loss of appetite, disordered digestion, and extreme lassitude. The patient was directed to take a teaspoonful in half a wineglassful of water four times a day, and in a few days he was quite well. Four cases of a similar character were treated in the same manner, with a rapid and successful result. Dr. Jackson relates other cases in which the solution of the permanganate was equally beneficial, one being a case of abnormally large secretion of urine. But the most remarkable and almost marvellous effects of this salt are observed in the treatment of gangrenous wounds, and for this purpose it has been employed in several of the hospitals in the United States. Having thus proved the decided therapeutic action possessed by this substance, Dr. Jackson endeavoured to ascertain its active principles, and with this view he tested it for ozone, which he found in great abundance. He regards the solution of permanganate of potash as containing, besides the salt itself, ozone (which is an allotropic form of oxygen) and the peroxide of hydrogen, which may be regarded as water in combination with *antozone*, another allotropic form of oxygen. These bodies possess the power of arresting the process of disorganization in living tissues, and arousing the vital action in decaying structures.

XII. *On the Influence of Living in the Open Air in the Treatment of Phthisis.* By Dr. James Blake, of San Francisco, California. (American Journal of the Medical Sciences, October, 1863.)

Dr. Blake relates the particulars of seven cases showing the influence of what may be called the out-of-door plan of treating phthisis. The treatment pursued was to direct the patients to live entirely in the open air during the summer months, at an elevation of from three to five thousand feet above the sea, in the coast range of the mountains of California, where the temperature is very equable, and no rain falls for five or six months. This part of the world seems peculiarly well adapted for carrying out the treatment, for when the rainy season arrives, a sea voyage of four or five days may take the patient to Northern Mexico, where the winter climate is exactly analogous to the summer climate of San Francisco. The patients are directed not even to sleep in tents, but out under the trees, and the diet is plain camp fare, sufficient game being found in the mountains to keep the camp supplied. Dr. Blake believes that when the patients are able to avail themselves of the advantages of the summer climate of California, and of the winter climate of Mexico, there are few cases that cannot be cured, except those in which the destruction of lung tissue is already too extensive. In the instances related by Dr. Blake, the patients had tried the usual remedies without any benefit, and the constitutional and local symptoms were carefully investigated, and the weight of the body was ascertained from time to time. The increase of weight is a more evident and tangible indication than any other of the success of the treatment, and this favourable result was observed in all Dr. Blake's cases.

XIII. *On the Therapeutic Effects of the Resinous Vapours of the Coniferæ.* By W. W. Ireland, M.D. (Edin. Medical Journal, Feb., 1864.)

Dr. Ireland has already made the observation that in pine-forests the quantity of ozone in the air was increased by their resinous emanations, which contained, if not ozone itself, at least a substance possessing many of its properties. He now records some practical observations made at a little town called Die, in the south of France, on the therapeutic effects of resinous vapours. This kind of treatment was in popular use among the mountains of Dauphiné for more than a century, and was discovered by accident. Some labourers were cutting wood for preparing pitch, when one of them was suddenly seized with acute rheumatism in the legs, which disabled him from the more active work, but allowed him to arrange the cut wood in the furnace. After working a little time at this employment, which exposed him to the resinous vapours of the wood, he felt his complaint gradually disappearing; and the cure thus effected became known among the peasantry, and subsequently attracted more particular attention. Dr. Chevandier, finding that the peasants suffering from rheumatism exposed themselves to the vapours of a pitch furnace, and thus became cured of their complaints, examined the subject in a scientific manner. He found that the peasants had been in the habit of sitting in the furnace at a heat of nearly 190° Fahrenheit; and his own experiments showed that in an atmosphere saturated with turpentine vapours, that very high temperature was not only tolerable but pleasant, and he himself entered the furnace to study the physiological effects. He found that the skin perspired freely, the pulse rose, and his sensations were agreeable. Since these experiments were made, some baths have been used at Die, on the same principle as the pitch-furnace. They resemble a large baking-oven, the fire being below, and the resinous layers of pine-wood are strewed upon the floor, and the patient sits upon a bench, wrapped in a porous covering of wool. The temperature to which the patients are exposed is generally from 140° to 158° Fahr., and they remain from fifteen to twenty minutes. The sensations of the patient are agreeable, and the perspiration is abundant, the pulse rising from ten to fifteen beats, and at first the respiration is accelerated. After the proper period has expired the patient goes to bed, where he remains an hour or two.

The diseases treated by this plan are rheumatism in all its forms, inflammation of mucous surfaces, as chronic bronchitis and laryngitis, neuralgia, glandular enlargements, and constitutional syphilis. Nine-tenths of the patients who come to Die suffer from rheumatism, the muscular form yielding more readily than any other, but articular rheumatism yields more slowly. After rheumatism, chronic bronchitis appears to be most benefited by this treatment, probably from the effects of the vapour on the diseased mucous membrane. Five cases of phthisis are also said to have been successfully treated by courses of twenty baths, but most of the cases were in the first stage. Pectoral complaints never occur among those who work in turpentine, and in the south of France it is known that these maladies and rheumatism are comparatively rare among the inhabitants of districts covered by pine-forests, and hence it would appear that the resinous vapours possess some important therapeutic properties in these diseases. Dr. Ireland suggests that the beneficial effects may be due to the influence of ozone or antozone upon the blood. Hence fumigations of the resinous layers of fresh pine-wood, or of oil of turpentine, may be beneficial in phthisis, or the patient may live in a room or conservatory filled with saplings of pine. Baths, like those used at Die, have been attempted in other places, as at Grenoble, Valence, and near Vaucluse, but the wood the inhabitants employ is said not to be the same, and Dr. Ireland recommends patients labouring under obstinate rheumatism or bronchitis to go to Die, which is reached by a diligence starting from the railway-station at Valence. Die is a small town situated in a beautiful valley among the Alps of Dauphiné, the lofty peaks of which guard it from the Mistral, and its elevated situation saves it from the scorching heat of the summer of the South.

XIV. *On the Therapeutical Action of Ipecacuan in large Doses.* By M. Péchollier, of Montpellier. (L'Union Médicale, March 31, 1864.)

M. Péchollier has arrived at his conclusions as to the action of ipecacuan from experiments made on the lower animals, and from observations on public and private patients. In the case of healthy animals, the administration of ipecacuan in various doses gave rise to a diminution in the number and in the force of the beats of the heart, in the animal heat, in the number of the respirations, in the quantity of blood flowing to the lungs, and in the nervous action, the nerves of sensation being paralysed more than those of motion. M. Péchollier's clinical observations have been made principally on patients affected with pneumonia, acute bronchitis with fever, capillary bronchitis, and pulmonary engorgement attendant on typhoïd fever. In such cases the following results have been observed after the administration of ipecacuan—namely, retching and vomiting, the latter being sometimes so violent as to necessitate the discontinuance of the drug, a speedy and more or less considerable diminution in the number of pulsations and respirations, and in the animal heat, an augmentation and greater facility of expectoration, the sputa becoming, in pneumonia, less coloured and more homogeneous, and an improvement in the stethoscopic signs varying according to the nature of the disease. From comparative experiments, both physiological and clinical, made with tartar emetic, M. Péchollier concludes that the contra-stimulation produced by ipecacuan is more rapid, less marked, and more transient than that of the antimonial salt.

The most remarkable results were obtained in pneumonia, and especially in those cases which may be distinguished as *catarrhal*, by which word

M. Péchollier designates the attacks which appear in the spring, when there are sudden changes of temperature; and which are characterized by erratic shiverings intermingled with flushes of heat, instead of the intense shivering of inflammatory pneumonia, diffuse pain in the side, crepitant rhonchus surrounded with subcrepitant and sibilant rhonchus, compressible pulse, &c. In such cases, which are unsuited for bleeding and tartar emetic, ipecacuan has been proved to be very beneficial, according to M. Péchollier's experience, resolution having taken place in two cases on the third day, and almost always before or towards the seventh. The same results have been observed in the pneumonia attending typhoïd fever, but they were less constant and striking. Ipecacuan, therefore, according to M. Péchollier, is in large doses the great remedy for catarrhal pneumonia, and in general for all kinds of pneumonia in which the vital powers, without being completely deficient, are not in great excess. In acute bronchitis with fever, ipecacuan favours the cessation of fever and cough, and accelerates convalescence, but capillary bronchitis is less amenable to this kind of treatment. M. Péchollier insists very strongly upon the mode of preparation, the administration, and the dose of ipecacuan, as he considers these to be fundamental conditions of success. The smallest dose employed by him, since his physiological experiments, was 4 grammes a day (upwards of 60 grains) for an adult, but his ordinary dose was 6 grammes (upwards of 90 grains), and he has raised the dose to 8 or even 10 grammes in the twenty-four hours. The drug was not prescribed in powder, but in infusion in water; and some syrup of digitalis was generally added, together with some laudanum, to prevent or diminish the vomiting.

XV. *On the Treatment of Dysentery by the Nitrate of Silver.* By Dr. T. Caradec, of Brest. (L'Union Méd., Feb. 11, 1864.)

Dr. Caradec relates the particulars of six cases, in which the nitrate of silver was successfully employed in the treatment of dysentery, and he thinks that the results ought to convince those who are still in doubt as to the efficacy of this plan. He describes the action of the nitrate as being remarkably beneficial, for it exercises such a favourable influence on the congested and swollen intestinal membrane, that tranquillity soon returns to the patient, the stools are improved, the blood and slimy secretions disappear, and the tenesmus is arrested. The treatment by the nitrate of silver is therefore at once sedative, antispasmodic, and to some extent abortive, and it might almost be added, specific, since in certain cases such sudden and surprising changes are effected. Dr. Caradec does not, however, assert that the nitrate ought to be employed in dysentery to the exclusion of all other medicines, or that it is infallible in its operation, but he maintains that in the districts where he practises, there is no agent superior to it in the treatment of dysentery, and that it ought to be frequently employed in order to secure its beneficial effects. It may be employed either in the form of pills or in injections, according to the more or less extensive seat of the affection; it is quite as efficacious in the acute as in the chronic form, and in the inflammatory, adynamic, or other forms, and as applicable in the cases of children as in adults or old people. In fact, according to Dr. Caradec, the contra-indications to its employment are rare and exceptional, especially in the sporadic dysentery of Europe. It soothes and relieves the pains of the stomach and the tenesmus; it at first diminishes, and afterwards completely relieves the muco-sanguinolent discharge. The doses vary according to the age of the patients, their individual susceptibility, and the seriousness, the extent, and the duration of the disease.

XVI. *On the Adulterations of Senna.* (L'Union Médicale, Jan. 21, 1864.)

The leaves of senna may be adulterated in various ways. In Egypt they are mixed with the leaves of the *Cynanchum Argel*, which are more bitter than those of senna, and contain an irritating principle which renders their use dangerous. But when senna comes into France, it is sometimes adulterated with the leaves of a shrub found in Provence and Languedoc—the *Coriaria Myrtifolia*. This plant has very astringent and poisonous leaves, used for dyeing black and in tanning leather; and M. Guibourt states that its fruit causes convulsions, delirium, and even death, in man and the lower animals. M. Riban has examined the properties of the plant, and from a series of experiments on animals, he concludes that the *Coriaria Myrtifolia* owes its poisonous properties to a substance which he calls *coriamyrtine*, producing convulsions similar to those produced by the plant itself. He administered it to dogs and rabbits, and found that the chief symptoms of poisoning were violent movements of the head, communicated to all the limbs, clonic and tetanic convulsions returning by fits, contraction of the pupils, trismus, foaming at the mouth, and at last asphyxia. The most important post-mortem appearances were the presenee of a brownish coagulated blood in the cavities of the heart, pulmonary artery, and inferior vena cava, brown spots on the lungs, and injection of the membranes of the brain. The intestinal mucous membrane was not irritated, and the proper muscular contraction was not destroyed. The leaves of the *Coriaria Myrtifolia* may be distinguished from those of senna by the fact that the former have three very prominent veins springing from the petiole and prolonged to the point of the leaf, while the senna leaves have only one prominent vein, with several smaller ones proceeding from it. The leaves of the *Coriaria* are also thicker than those of senna, and have an astringent taste.

HALF-YEARLY REPORT ON PATHOLOGY AND PRINCIPLES AND PRACTICE OF MEDICINE.

By Francis C. Webb, M.D., F.L.S.,

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I. *The Morbid Anatomy of Leprosy.* By H. V. Carter, M.D. Lond. ('Transactions of the Medical and Physical Society of Bombay,' for the Year 1862.

The subjoined is an abstract of Dr. Carter's observations on the morbid anatomy of leprosy, as seen in India. These observations form part of a most valuable paper on the history, symptoms, and pathology of the disease. 1. In ordinary leprosy, the brain and its membranes are not diseased, and during life there is an absence of symptoms indicating any affection of the brain. 2. In all the varieties of leprosy, the spinal cord and its membranes have been found unaffected; the roots of origin of both cranial and spinal nerves in no instance appeared abnormally changed. 3. In no case was there any evidence of disease in the larger ganglia of the sympathetic in the neck, thorax, abdomen, and pelvis. No clear evidence of disease was detected in the ganglia on the posterior roots of the spinal nerves, nor in the Gasserian ganglion of the fifth cranial nerve. 4. The heart was generally healthy; the aorta and arterial system generally were free from atheroma; the pericardium was usually clear. 5. The lungs were not affected in any special way; in one-half the cases the organs were healthy; in the remainder, adhesions, congestion, condensation, and emphysema were the principal changes observed. The pleura was never alone diseased. 6. The intestinal canal presented no uniform or marked disease. 7. The liver was almost invariably healthy. 8. The pancreas always seemed healthy. 9. The spleen was occasionally soft, enlarged, and the capsule thickened; once there was fibrinous deposit. 10. The kidneys, in fifteen cases, were one or both six times noticed as large, as often small, thrice as natural in size; seven times they were mottled, and in three cases they exhibited more distinct deposit; once also cysts. In the seven cases fatty degeneration existed four times. Leprosy is not unfrequently accompanied by disease of the kidneys, such as may at least hasten its fatal termination. 11. The suprarenal capsules were healthy in all cases examined. 12. The blood was in no uniform condition, nor did it ever strike the author as peculiar in appearance. 13. The lymphatic vessels and glands were not affected in any special way, as far as examined; the latter were noticed as enlarged in about half the cases, either in the loins, where a deep red colour was also common, or mesentery where once they were very numerous, or in the groins, &c. 14. With regard to the blood-vessels in the distorted hands, &c., on several occasions they were carefully examined, and to all appearance were unchanged, certainly not diminished in calibre; in an injected specimen, the size had run freely into the capillaries of the skin and Pacinian corpuscles. There is no reason to infer that deficient arterial supply is the cause of the atrophy or ulceration. 15. The state of the small muscles is what might be anticipated. Those of the little finger are sometimes entirely converted into fibrous tissue. No fatty degeneration of the fibres was observed. The flexor carpi ulnaris (supplied by a diseased ulnar nerve) has been found undergoing a similar conversion; but usually the muscles of the forearm and leg are seldom much changed, nor is their action greatly interfered with. 16. It is in the nerves that the chief interest centres. The diseased nerve is swollen, but not abruptly so, and of a dull reddish-grey, or semi-translucent aspect, rounded and firm. Its coat of connective-tissue is little changed, the funiculi alone being the seat of the disease. These, enlarged and grey in colour, impart a streaked or marble appearance, and when the nerve is cut across they start up separate and firm, almost as if previously under some degree of tension; in the healthy nerve they rather droop. On further examination, the clusters of nerve-tubules are found to have mostly disappeared, their place being taken by a clear gelatine-like deposit, which has separated and compressed them; this is provided with nuclei and fibres, the latter curiously arranged round each tubule, and thus mapping out, as it were, the area into rounded or polygonal spaces, in each of which lie the remains of one or two altered nerve-tubules. The general cellular investment of the nerves is but little altered. The amount of enlargement varies from just above the normal size (at the seat of disease, above or below it, the nerve may be smaller than natural) to more than twice that; the colour may be grey, reddish-grey, reddish-brown, or very rarely a dead opaque white; the consistence of all degrees from almost flabby to semi-cartilaginous, but generally firmer than natural; marked vascularity is uncommon; adhesions have been found, but only under exceptional circumstances. The cutaneous nerves are altered in a similar manner. These changes do not occur indiscriminately in the course of the nerves, but make their appearance at certain selected spots: for the compound trunks, where they are most superficially placed, for the cutaneous nerves immediately after they have perforated the deep fascia. As regards the former, the nerve-trunk above the "locus morbi" may be unchanged; below it is usually atrophied; the apparent extent of the disease may be limited to two or three inches. In both sets of nerves the terminal branches will be found atrophied and pearly in aspect, being, in well-marked cases, evidently incapable of performing their functions. In nerves of compound function the sensory or cutaneous segment alone may be diseased being traceable by the eye for some distance upwards, in continuation of the altered cutaneous branch, after it has joined the main trunk. This fact, as well as others, shows that the morbid changes proceed from the periphery towards the centre. The author appends a table of the nerves which he has found diseased; in the upper extremity, the ulnar and radial nerves; and in the lower, the musculo-cutaneous are most frequently affected. Microscopic examination of the diseased nerve shows that the neurilemma may be slightly thickened and marked by fusiform granular masses, or more distinct oval granular nuclei; on its inner surface accumulations of granular matter or nuclei occur, and here the septa pass off which map out the area of the diseased funiculus. The septa are composed of nucleated fibrous tissue; the space they enclose is polygonal, and from $\frac{1}{400}$ to $\frac{1}{1500}$ inches in diameter; it is occupied by a clear homogeneous refractile substance, in which the wasted nerve-tubules are imbedded; the latter are much changed, their medullary sheath corrugated, and contents granular and firm; their diameter very irregular, according to the amount of compression they have undergone. It occasionally appears as if the tubules were emptied, their collapsed and folded walls alone remaining. In still more diseased funiculi mere granular streaks or lines of minute nuclei alone are seen, or all traces of the tubules may be wanting, the whole being converted into fibrous tissue. The author cannot say whether the axis cylinder is affected or not. The Pacinian corpuscles in the hand and mesentery are sometimes found enlarged, their pearly tint little changed, and their consistence firm. The papillæ of the smooth atrophied wrinkled skin of the benumbed surface are either diminished in size, or wanting. In one case, the altered papillæ were found to contain vascular loops, but no tactile corpuscles. 17. The skin and mucous tissue are only specifically affected in the tubercular and mixed varieties of leprosy. The mucous membrane of the hard palate, tongue, and larynx, is frequently the seat of tumefaction, or of distinct tubercles, presenting the same character as the tubercles of the skin. The skin-disease is limited to the dermoïd and subjacent tissues, and consists in the deposit of a plasma, in which granules and nuclei appear. This deposit is of the same character as that found in the nerves. 18. Changes in the bones of the hands and feet. The digits of both extremities are most affected; the terminal segments become atrophied at the commencement of the symptoms, and the other rows, and the metacarpal and metatarsal bones, are attacked in succession. The changes consist of atrophy of the shaft, part or whole, disappearance of the head or distal end, with persistence of the basis or proximal ends of the bones. The carpal bones are more seldom altered, but are occasionally found rarefied. When the ulnar nerve is chiefly diseased, the bones on the inner or ulnar side of the hand are principally affected. The same correspondence is observed in the foot. Caries or necrosis also attacks the bones. This generally occurs at the first or second joints of the digits, extrusion of the fragments taking place on the dorsal aspect. Microscopic examination showed that the compact osseous tissue appeared to be permeated everywhere by channels like dilated Haversian canals. The bone-cells were but little changed. The cancellous tissue seemed only rarefied. The author gives the name "*molecular destruction*" to this condition, the tissue absorbed not being restored as usual.

II. *On Neuralgia and its Connexion with Pain over the Spines of Certain Vertebræ.* By M. Trousseau. (L'Union Médicale, February 13, 1864.)

In the course of a clinical lecture on neuralgia, M. Trousseau makes the following observations: "If neuralgia occupied the branches of the trifacial, it was always at the point of emergence of the ophthalmic branches, and of the superior maxillary and the inferior maxillary, that the pain was felt most acutely; then came the frontal point where pain rarely failed, then the parietal point where it was more frequently wanting; lastly, the occipital nerve, although having no relation of origin with the trigeminal, is almost always affected. An extraordinary thing—inexplicable, but invariable in all the cases which we have carefully observed and noted—is that whether the trifacial were alone attacked, or the occipital nerve simultaneously affected, pressure on the spinous apophyses of the first two cervical vertebræ was *always* very painful, and in a certain number of cases immediately awakened the pain in the affected nerves. If the nerves of the brachial plexus were attacked, invariably pressure over the spinous apophyses of the last cervical vertebræ produced pain, and it was the same when we explored the vertebral column in the case of intercostal, lumbar and sciatic neuralgia." M. Trousseau lays it down as a rule, that in the various neuralgias the spinous apophyses are painful at a point nearly corresponding to that at which the nerve emerges, and not unfrequently the pain extends a little higher up the vertebral column.

III. *Therapeutics of Inflammation of the Lungs.* SKODA. (Allg. Wien. Med. Zts. viii. 5, 6, 1863; Schmt. Jhrb., B. 119, Hft. i. pp. 34, 35, 1863.)

Incipient pneumonia is never recognised with certainty, and sometimes is not even suspected. All observation and experience of a pneumonia nipped in the bud reduces itself to a conjecture, and the belief founded thereon is overthrown by the facts, that pneumonia may become severe and fatal in spite of treatment by the indicated means from the beginning and continually; and that, on the other hand, in spite of false treatment, it may run a slight and favourable course. In spite of immediate hydropathic treatment, it may become serious and fatal. Cases treated on Brown's system, with camphor and the like, differ in no respect from cases treated after other methods. Inhalation of sulphuric ether from the very beginning does not, according to the author's experience, delay the development of pneumonia, and produces no appreciable alteration of its course. From these facts he draws the conclusion that the mere suspicion of pneumonia at the beginning of a febrile attack, does not warrant the adoption of therapeutics, which the existing symptoms would not call for.

Statistical observations on pneumonia treated in various ways, showed that the class of general hospitals where venesection was not used gave the most favourable, that in which venesection was most used, the least favourable rate of mortality. Observations made during the last four years gave no pregnant results; the therapeutics had become everywhere the same. Skoda experimented for six years on the treatment of pneumonia. This time, the observation that the rate of mortality was rendered more favourable by abstinence from bloodletting, was not corroborated. In general, experience brought out that the rate of mortality for each of the various modes of treatment might, in a given period, be extremely favourable, or, on the contrary, extremely unfavourable. No reason could be discovered for this variation; in no instance did the genius epidemicus play any part in it; and Skoda arrived at the conclusion that, on the whole, therapeutics exercised no marked influence on the rate of mortality. No specific against pneumonia has yet been found, only the sufferings of the patient may be mitigated, and individual, troublesome, and dangerous accidents may be removed.

Venesection Skoda recommends only when one or more symptoms, which can be relieved by it, are present in a degree threatening life—delirium, sopor, convulsions, in consequence of congestion of the vessels of the neck, suffocation in consequence of copious bloody secretion in the bronchi, or rapid extension of infiltration. Generally, venesection does not prevent a fatal termination, but some favourable cases are recorded. If venesection is urgently demanded, one must not refuse it, provided that there is no anæmia.

Skoda obtained no certainly favourable results from the employment of tartar emetic, ipecacuanha, corrosive sublimate, digitalis, opium, quinine, &c.; and finally declares that therapeutics, especially the omission or employment of venesection, is without influence on consecutive diseases, and especially on tuberculosis.

IV. *Enlargement of the Heart in Chlorosis.* By Dr. T. Stark. (Arch. de Heilk. iv. 1, p. 47, 1863.)

Dr. Stark communicates four cases from the Clinique of Gerhardt, in which hypertrophy of the heart coexisted with chlorosis, and in three of the cases was controlled by the means used.[1]

In the first and fourth cases, the patients came under observation after three months, in the second after three years' duration of the illness, with marked symptoms, especially with chlorotic appearance, weakness and flabbiness of texture. Improvement soon followed on the exhibition of preparations of iron; at the same time there was also lessening of the increased precardiac dulness, especially in width. The hypertrophy depends on a simple relaxation of the muscular tissue of the heart, or on a relative insufficiency of the mitral valve caused by this. Dr. Stark considers the former the most probable, without being able to assign positive reasons (disturbance of nutrition, in consequence of varying supply of blood?). He explains, consequently, the difference between this condition and that insufficiency of the mitral valve which depends on an anatomical alteration of the valves. Frequently the course of the disorder brings about a clearer decision.

V. *The Hæmostatic Treatment of Cholera, Hæmorrhage, Exhaustion, &c.* By Thomas A. Wise, M.D. (Dublin Quarterly Journal of Medical Science, August, 1863.)

Dr. Wise's treatment consists in intercepting the blood in the extremities by the application of tourniquets or tight bandages. The circulation may be controlled in two ways: 1st, by retarding the blood in veins, and 2ndly, by stopping the circulation in arteries. By retarding blood in the veins of a limb, the temporary withdrawal of a certain quantity of blood from the general system is effected. The retention of blood in the extremities may be used with advantage in patients with the premonitory symptoms of apoplexy, in severe dyspnœa, in some organic diseases, and in inflammatory affections of particular organs. By stopping the arterial circulation in a limb, one or two pounds of blood are prevented passing into it; the blood makes its way back to the heart, and a more rapid and forcible circulation in a diminished circle is produced, the volume of blood is enlarged, and the force of the heart increased. In sudden and severe cases of uterine hæmorrhage, and in the collapsed stage of cholera, this treatment has proved of the greatest service. In the collapsed stage of cholera, the tourniquet may be applied to two or four extremities, according to the effect intended to be produced. Dr. Wise recounts eight cases of cholera, so treated in India. Two of these proved fatal from the patients not submitting long enough to the treatment. The others recovered. When the patient

[1] It follows that the hypertrophy disappears with the cure of the chlorosis, and the heart again resumes its normal dimensions.

is weak, and the state of collapse great, more care is required in emptying by friction the blood in the veins of the extremity to be bandaged; and the effect will be more marked if the tourniquet be applied to four extremities. It may be kept on for hours, or even for a day or two. In one case, Dr. Wise kept the tourniquet applied for three days, as the exhaustion was very great, with the best effects, only relaxing one or more as it appeared necessary. He has never seen any bad effects produced by their application. He draws the following conclusions from his experience of the use of the tourniquet in the collapsed stage of cholera, in exhaustion, &c.

1. From its obstructing the circulation, it immediately stops the distressing cramps of the extremities in cholera.

2. By increasing the quantity of the circulating fluid in the trunk, and thereby stimulating the heart's action, it removes morbid congestions, stops the secretions from the bowels, increases the animal heat, and powerfully tends to restore health.

3. By improving the vigour of the system, medicines act more powerfully, and in a more salutary manner, in removing morbid actions.

4. When the reaction has taken place, by loosening the tourniquet with care, the determination of blood to the internal parts is diminished by its diffusion over the extremities upon which the tourniquet has been placed. They are to be immediately replaced when there is any coldness or weakness experienced. Relapse must be most carefully watched for and prevented.

5. By increasing the volume of blood in the contracted circulation, the force of the heart is increased, local congestions are removed, and the whole system is strengthened.

VI. *Salaam Convulsion.* By W. J. Cox, Sodbury Union, Gloucestershire. (Dublin Quarterly Journal of Medical Science, May, 1863.)

In a paper on the more rare nervous diseases of children, Mr. Cox relates the following case:

E. F., a boy nearly three years of age, well nourished and apparently healthy. His father was subject to occasional epileptic seizure. The mother said that the child, having been somewhat out of health for some days previously, dull and peevish, had that morning been seized, immediately after awaking from a disturbed and moaning sleep, with a fit of violent nodding of the head, accompanied at intervals by loud screaming. When Mr. Cox saw the patient, the screaming had ceased, but the bowing continued. The head was projected forwards and downwards with great force and frequency, the convulsive movements averaging 40 in a minute. Sometimes a rest of five or six minutes occurred, and then the salaams were renewed as before. At every seventh, eighth, or ninth bow, a more powerful automatic movement brought the head almost to the thighs. There was no strabismus nor heat of scalp, fever, or vomiting, but the pulse was 168. The motions ceased gradually after an hour and a half's duration. They were resumed the next morning with greater violence, and went on increasing (but never occurring more than once during the twenty-four hours) for eighteen days, when they issued in two attacks of general convulsions, after which a perfect recovery took place. Calomel and rhubarb, iodide of potassium, steel, hydrocyanic acid, the warm bath, and chloroform in the form of chloric ether, were administered. The latter was the only remedy which appeared to do good, but it was not administered until two days before the general convulsions occurred. Mr. Cox, in remarking on the case, agrees with Mr. Newnham that the affection is of spinal origin, and allied to epilepsy. He thinks that it probably had its origin in the medulla oblongata.

In one case given in the 'Journal für Kinderkrankheiten,' the patient became a confirmed epileptic; and in two cases mentioned by Churchill, one terminated in epilepsy, the other in idiocy.

VII. *On the Visceral Lesions which may be referred to Constitutional Syphilis.* By M. LANCEREAUX. (Gaz. Méd. de Paris, Jan. 30, 1864.)

The lesions which are developed in the viscera under the influence of constitutional syphilis present generally anatomical characters as constant and distinct as are syphilitic dermal manifestations. Looked at together, these lesions do not wear a single or uniform appearance; they may, however, be grouped very naturally into the three following forms: 1. The interstitial inflammatory; 2. The gummatous; 3. The cicatricial. Certain organs, as the liver and testicle, into the structure of which an abundant fibrous stroma enters, are more particularly the seat of the first of these forms. New elements—nuclei, cells and fibres of connective-tissue—develope in the organic tissue. There is at first an augmentation of volume, and later, by virtue of the special properties of the newly-formed tissues, a diminution and atrophy of the organ. At this period furrows and depressions are found scattered over the surface of the gland, giving it a very characteristic appearance. In the liver it is a lobular cirrhosis (*cirrhose à gros grains*), quite different from the granular cirrhosis of drunkards (*cirrhose acineuse ou à petits grains*). Less distinct in some viscera, as the brain, the kidneys, the lungs, and the heart, for example, this form is more difficult to recognise, especially when isolated. In these organs it shows itself as cerebral hardening, or cerebral softening, interstitial nephritis, pneumonia, and chronic myocarditis. Tumours of the size of a pea, a nut, or a bean, generally known as gummata, characterize the second anatomical form of visceral syphilis. Differing little in different organs, these tumours have a firm or soft consistence, a greyish, whitish, or yellowish colour, according to the period of their evolution, and the relative proportion of their histological elements, nuclear, cellular, and fibrous; they are usually seated in the midst of a dense fibrous greyish tissue, vascular, and very resistant under the finger. This tissue forms a kind of cystic envelope for the tumours, from which it is at times possible to enucleate them; and it constitutes by its disposition one of the best characters by which they may be distinguished from tuberculous, cancerous, and other non-syphilitic lesions. In the first instance, these tumours are constituted of the embryonic elements of connective-tissue. After arriving at a certain degree of development, these elements undergo gradually the different phases of retrogression or fatty degeneration. There results the possibility of spontaneous resorption of these products—a favourable termination, doubtless, but liable to leave behind such various lesions as membranes apparently cystic (brain), fibrous bands, cicatrices (liver). In some cases, however, there is a calcareous transformation of the syphilitic tumours. The cicatricial alteration of the viscera in syphilis, which is in reality only one of the modes of termination of the preceding forms, is characterized by the presence on the surface of the organs of cicatricial furrows, single or multiplied, simple or stellate, of depressions more or less deep, and by bands or fibrous network in the interior of the parenchyma. Of these lesions, the first differ from consecutive atrophy or vascular obliterations in the existence of a fibrous tissue, generally abundant at the level of the depressed point, and by a disposition which is never in relation—as in consecutive lesions from the obstruction of arterial or venous canals—with the distribution of the vessels. They are distinguished from traumatic cicatrices by the absence of the colouring matter of the blood. The second are distinguished from absorbed or cicatrized purulent foci by their multiplicity, and also by the absence of purulent detritus in the neighbourhood, and in the thickness of the cicatricial membrane. To these forms of change there is added, in the case of the vascular blood-glands, hypertrophy, with or without alteration of their active elements. Out of 24 cases, there was hypertrophy of the spleen in 10; of the lymphatic glands in 10; of the thyroid body in 4, and of the supra-renal capsules in 2. Studied in each particular organ, syphilitic manifestations have their most common seat in the liver. In the course of his examinations, the author found in this organ interstitial hepatitis, or syphilitic cirrhosis three times; gummata without cicatrices once; cicatrices without gummata seven times; cicatrices of the surface of the liver, with gummata in the substance of the organ, eleven times. The liver was also generally found adherent to the diaphragm or to the neighbouring viscera. In the kidneys, interstitial nephritis occurred three times; nephritis with cirrhous degeneration twice; small disseminated tumours once, and cicatrices on the surface, with atrophy, twice. The testicles were affected in three cases. In one there was augmentation of the volume of both organs from gummatous masses, and a complete disappearance of the glandular element; in the second gummata were present in one testicle, the other having been attacked by interstitial orchitis; in the third there was peri-orchitis. Similar alterations are observed in the ovaries. In the brain the author found old gummatous tumours, partly transformed into fatty substance twice; an apparently cystic membrane, with numerous partitions, occupying the greater part of the right anterior lobe, having given rise to consecutive atrophy of the corresponding anterior pyramid, and of the antero-lateral fasciculus of the opposite side once; cicatrices on the surface of one of the convolutions, and a fibrous cicatricial band at the limit of the white and grey matters once; and amyloid degeneration and softening of the pons once. In the lungs there was chronic pneumonia, with excavations, in two cases; gummata in three; cicatrices on the surface in one; contraction with dilatation of the bronchia in two; cicatrices and ulcerations of the pharynx in several instances, and ulceration of the large bronchi in one. The heart, in one case, presented gummatous myo-carditis, characterized by the presence of disseminated tumours in the substance of the fibrous tissue, with ulceration or disappearance of greater part of the muscular fibres; in one there was simple myocarditis, and in one lardaceous degeneration. The author adds, that sudden death has been in some cases the result of the cardiac lesion.

VIII. *Temporary Insufficiency of the Valves of the Heart.* By Professor Skoda. (Allg. Wien. med. Ztg. viii. 1, 2, 1863; Schmidt's Jahrb., B. xviii. Heft 1, 35, 36, 1863.)

A butcher, aged sixteen, was admitted December 11th, 1862, with very severe symptoms of fever. Examination of the heart also discovered marked enlargement of that organ, a systolic murmur in the left ventricle, and increased loudness of the second sound in the pulmonary artery. There was enlargement of the spleen, and albuminuria.

On December 12th, the systolic murmur in the left ventricle was weaker, the præcordial dulness diminished, the impulse of the apex was not so far to the outside.

On December 13th, the patient died.

Post-mortem Examination.—Heart flabby, pale, easily torn; in its cavities a little fluid blood; the valves normal. (The rest of the post-mortem appearances confirmed the diagnosis of typhus fever.)

Skoda remarks that the normal condition of the valves furnishes only negative proof of the correctness of the diagnosis; the direct proof lies in the disappearance of the insufficiency before death.

Skoda observes that the disease had much more the character of typhus than of endocarditis. Even at the commencement, a paralytic condition of the papillary muscles, and partially of the substance of the heart, would account for the symptoms as well as endocarditis. Even as in typhus the intestines can be paralyzed, and, in consequence, distended with gas, so the heart may become larger, and partly in consequence of this enlargement, partly in consequence of paralysis of the papillary muscles, an insufficiency of the valves is established, through which the murmur is explained. Such an insufficiency, especially of the biscupid valve, may take place in any fever—in typhus, variola, or scarlatina; at the same time, temporary paralysis of the substance of the heart causes enlargement of it. If these circumstances appear at the beginning of the illness, the anomalies of the heart's movements, thereby produced, usually disappear again after a few days. If they first appear later in its course, their disappearance is not so easily to be looked for; more often the paralytic phenomena prevail even to the suppression of the heart's movements and of the circulation. Endocarditis, as a complication of typhus, is a much more serious process, as it usually persists longer, or leaves behind a damaged heart. But it often is impossible to distinguish at first glance between the two.

Finally, Skoda observes that a similar transitory paralysis of the musculi papillares may also come on in the apyrexial maladies, especially in hysteria, chorea, and epilepsy, when it gives rise to palpitation, with violent dyspnœa. The patient seems at the point of death, but suddenly recovers, and is almost quite well again.

IX. *Transitory Insufficiency of the Valves.* From Skoda's Clinique. Dr. B. London. (Oesterr. Ztschr. f. prakt. Heilk. ix. 42, 1863; Schmidt's Jahrb., B. cxxi. Heft 2, 175, 1864.)

A patient, aged sixteen years, who had never before been ill, was seized, November 2, 1862, with violent bleeding from the nose and mouth, and severe dry cough; also with pain in the pit of the stomach, which continued increasingly. On Nov. 10, the following was her condition: temperature of the skin elevated; lips and tongue dry; veins of the neck swollen; marked œdema of the feet; the precordial dulness was increased in extent; a systolic murmur was everywhere audible, loudest between the second and third ribs to the left of the sternum; the sound of the right ventricle was clear; the first sound of the left ventricle entirely covered by the murmur; the second sound of the pulmonary artery was accentuated. November 13, the systolic murmur had disappeared; the precordial dulness was diminished. November 14, death.

The diagnosis was typhus, with paralysis of the musculi papillares.

Post-mortem Examination.—Heart pale and flabby; valves normal.

X. *On the Spotted Fever as it occurred at Newport, Rhode Island, in the Months of January, February, March, and April,* 1863. By Philip S. Wales, M.D., Surgeon U.S.N. (American Journal of the Medical Sciences, Jan. 1864.)

In our last report we noticed the occurrence of a remarkable form of petechial fever which has lately been observed in the New England States. The paper of Dr. Wales gives an historical account of the prevalence of similar epidemics in the United States, and recounts the particulars of seven cases which occurred among the midshipmen billetted on the school-ship in the harbour of Newport, Rhode Island. During the winter of 1862–63, the fever showed itself among the U.S. troops at Portsmouth, Va., Annapolis, and Washington. In March, a limited but fatal epidemic occurred in Centre and York Counties, Pa., and about the same time a number of cases were observed in Philadelphia, and its neighbouring towns. The following is a *resumé* of the symptoms observed in the seven cases recorded :—"Patients are sometimes suddenly arrested in their employment or pastime with intense headache and delirium; but more commonly the disease begins with shifting pains in the extremities and joints, headache often of the most atrocious character, nausea, or vomiting, along with a chill, which last, however, soon subsides, and the characteristic delirium and dulness set in. The delirium varies in intensity, occasionally furiously maniacal, generally moderate and quiet; there is extreme restlessness and jactitation. The sensibility of the whole surface is sometimes so unwontedly increased, that the patient cannot even bear to have his hair touched. There is generally remarkable prostration of strength, and the limbs seem paralyzed and are numb, and in some cases even insensible; there is deafness, dimness of sight, or even complete loss of vision. A few have convulsions and opisthotonos. The tongue is moist, yellowish or brownish, never like the red, chapped, beef-like tongue of typhoïd. The pulse small, even thready; sometimes extinct in very malignant cases, irregular, or intermitting; skin cold, and occasionally of a deadly pallor, and like polished marble; eyes glassy, and the pupils irregular in their action, sometimes contracted, then suddenly dilated. When reaction takes place the pulse becomes fuller, skin warmer, and then there is marked uneasiness, the patient tossing himself in every direction with delirium; these symptoms remaining three days, the patient may be restored to convalescence, or the disease may advance into stupor, and come to a fatal termination. The intestines appeared in general to be exempt from the effects of the disease, except in one case where there was obstinate diarrhœa; the others occasionally required a mild aperient. The bladder gives sometimes great annoyance, and hæmaturia is encountered from the beginning. Profuse perspiration took place in one case, possessing a peculiar mawkish smell. In one case a prominent symptom was inability to swallow. One of the most peculiar marks of the disease is the *eruption*, which may occur in all stages of the disease; in three of the cases it made its appearance on the first day, on the second day in three, on the tenth in one. The spots assumed the form of small, round ecchymoses of various sizes, from the head of a pin to the size of a split pea, of a light red colour, like the bites of fleas. As the case advanced the splotches increased in size and coalesced, forming larger ones, or, properly patches, and in bad cases assuming a livid or purplish colour. Again, the form was that of reddish streaks, as if caused by striking the parts with a bundle of twigs. In all cases the eruption was even with the skin, and appeared first upon the extremities, generally the upper, and then over the face and trunk. The duration of the spots varied, sometimes disappearing in two or three days, at others holding on for a couple of weeks, and then gradually disappearing as convalescence set in, or becoming larger and deeper on approaching death; and when this event happened, they resembled bruises, were very distinctly marked, and those previously quite light, or almost imperceptible, were readily observed." It was impossible to trace the cause of the fever; the ship in which it occurred was in an excellent hygienic condition as regards cleanliness and ventilation. The disease is not believed to be contagious. The epidemic at Newport showed not the slightest disposition to spread. This fever appears to differ from ordinary typhus in its *duration;* many of the cases, and some extremely bad ones, mended rapidly from the third day, whilst of the deaths the greatest number occurred on the third or fourth days; in the *earlier appearance of the eruption*, which in the majority of cases appeared on the first or second days, and in its *showing no tendency to spread by contagion.*

XI. *The Yellow Colour of the Skin in Yellow Fever due to the Presence of Hæmatoidine.* By Dr. S. Fleet Speir. (American Medical Times, Nov. 7, 1863; and American Journal of Medical Sciences, Jan., 1861.)

Dr. Speir gives the following account of the post-mortem and microscopical examination of a case of yellow fever:—"The contents of the stomach and intestines were acid, and contained altered blood-corpuscles, and abundant granules of hæmatoidine. *Liver:* Its cells were large, and some of them fatty, but the greater portion presented the appearance of advanced waxy degeneration; there was abundance of hæmatoidine and a few blood-crystals. *Heart:* Granules of hæmatoidine, muscular fibres undergoing molecular degeneration. *Kidneys:* Fatty, granules of hæmatoidine. *Pancreas* and *supra-renal* capsules contained hæmatoidine. The skin and conjunctiva contained abundant granules of hæmatoidine, and seemed to derive their yellow colour from the presence of this substance. *Blood:* Some of the corpuscles were found altered and broken down." The examination of a case reported previously in the American Medical Times led Dr. Speir to suspect that the yellow colouration of the skin in yellow fever usually attributed to the presence of the colouring matter of the bile might be due to hæmatoidine. The above examination has confirmed him in that opinion.

XII. *Summary of Communications, for the Analysis of which space is wanting.*

On Meningo-Encephalitis as a Complication of Typhoïd Fever. By Dr. Vallin. (Gazette Médicale de Paris, January 9, 1864.)

On False Membranes and Extravasations of Blood produced by Inflammation of the Parietal Layer of the Cranial Arachnoïd. By Dr. D. Brunet. (Gazette Médicale de Paris, January 16 and following numbers, 1864.)

On the Spinal Symptoms which may accompany Typhoïd Fever. By Dr. E. Fritz. (Gazette Médicale de Paris, January 30, 1864.)

Theories of Purulent Infection. By Dr. Paul Dupuy. (Gazette Médicale, April 16-30, 1864.)

On a large Tumour formed by Hypertrophy of the Grey Substance of the Spinal Cord in a Fœtus of Six Months. By MM. Rayer and Ball. (Gazette Médicale, May 14, 1864.)

On the Ultimate Phenomena of Scurvy. By Dr. F. Rizet. (Gazette Médicale, May 21, 1864.)

Contributions to the Study of the Anatomical Alteration of Gout, specially of the Kidney in the Gouty. By MM. Charcot and Cornil. (Gazette Médicale, June 11, 1864.)

Conservative Medicine as applied to Hygiene. By Professor Austin Flint, M.D. (American Journal of Medical Sciences, October, 1863.)

Remarks on the Epidemic Influenza of 1861 and 1863, with Notices of some Malignant Forms of this Disease. By Dr. J. J. Levick, Physician to the Pennsylvanian Hospital. (American Journal of Medical Sciences, January, 1864.)

Prize Essay. Illustrations of Disease with the Microscope. By Francis Peyre Porcher, M.D. (Charleston, 1861.)

Delirium Tremens in the European General Hospital, Bombay. By A. H. Leith, M.D. (Transactions of the Medical and Physical Society of Bombay for 1862. Bombay, 1863.)

On the Prevalence of Typhoïd Fever in the Bombay Presidency. By John Peet, M.D. (Transactions of the Medical and Physical Society of Bombay for 1862. Bombay, 1863.)

A Commentary upon a Tabular Statement of the Number of Paxoxysms of Malarious Intermittent Fever that occurred in 146 Medical Charges in the Bombay Presidency in the year 1861, arranged as data for determining the question of the Moon's Influence upon these Fevers. By Professor H. Giraud, M.D. (Transactions of the Medical and Physical Society of Bombay for 1862. Bombay, 1863.)

Hospital Statistics of European and Native Troops from 1856 to 1860. By Dr. W. C. Coles. (Transactions of the Medical and Physical Society of Bombay for 1862. Bombay, 1863.)

Naval Medical Contributions: Dysentery, Erysipelas. By Dr. A. E. Mackay. (Edinburgh Medical Journal, January and February, 1864.)

The Epidemics of the General Prison at Perth, and of the City of Perth, Compared and Contrasted. By J. Bruce Thomson, Perth. (Edinburgh Medical Journal, March, 1864.)

Brief Notes of Twenty-four Cases of Diphtheria. By G. Stevenson Smith. (Edinburgh Medical Journal, March, 1864.)

Case of Aneurysm of the Aorta. By Dr. Robert Dyce. (Edinburgh Medical Journal, March, 1864.)

Observations on the Treatment of Epilepsy by Bromide of Potassium. By Dr. R. M'Donnell. (Dublin Quarterly Journal, February, 1864.)

Account of an Epidemic of Scarlatina observed at Nérac in 1861. By Dr. Pons. (L'Union Médicale, March 22 and following numbers, 1864.)

Memoir on Malignant Pustule from an Internal and Spontaneous Cause. By Dr. Devers. (L'Union Médicale, February 27 and following numbers, 1864.)

On Narrowing of the Trachea. By Dr. H. Bourdon. (L'Union Médicale, January 26, 1864.)

Auscultation in Diseases of the Respiratory Passages and of the Heart in Children. By M. H. Roger. (L'Union Médicale, October, November, and December, 1863.)

On Glosso-Pharyngeal Paralysis. By M. Trousseau. (L'Union Médicale, Oct. 6 and following numbers, 1863.)

On the Apophysary Points, and on their Connexion with Certain Pulmonary Affections. By M. E. Baudot. (L'Union Médicale, March 3, 1864.)

On Cerebral Rheumatism. By M. Trousseau. (L'Union Médicale, March 19, 1864.)

Case of Aneurysm of the Aorta in a Child Ten Years Old. (L'Union Méd., Feb. 25.)

Special Report on the Diseases of the Skin treated in the Hospital at Canstatt in the Years 1855 to 1861. By Dr. v. Veiel. (Schmidt's Jahrb., Band cxvii. Heft 3, 296–300.)

Clinical Observations of Measles, with especial regard to the Temperature. By Professor H. Ziemssen and Dr. P. Krabler. (Greifswald Med. Beitr. 1, 117, 1863. Schmidt's Jahrb., Band cxviii. Heft 3, 298, 1863.)

On Reduplication of the Pulse, and of the Sounds of the Heart. By Prof. Skoda. (Allg. Wien. Med. Zts. viii., 3, 4, 1863. Schmidt's Jahrb., Band cxviii. Heft 4, p. 28, 1863.)

Contributions to the Pathological Anatomy of Congenital Syphilis. By Professor Förster. (Würzb. Med. Ztschr. iv. p. 1, 1863. Schmidt's Jahrb., Band cxviii. Heft 4, 43, 1863.)

Report on the Latest Contributions to our Knowledge of Epilepsy. By Dr. Finkelnburg, of Bonn. (Schmidt's Jahrb., Band cxix. Heft 1, 90–102, 1863.)

On Grey Degeneration of the Spinal Cord. By Dr. Leyden. (Deutsche Klinik, 13, 1863. Schmidt's Jahrb., Band cxix. Heft 2, 167, 1863.)

Report on Recent Contributions to Laryngoscopy. By Dr. L. Merkel. (Schmidt's Jahrb., Band cxix. 313–54, 1863.)

The Method of Electrical Examination of the Nervous System for the purpose of Diagnosis. By Dr. M. Benedikt. (Allg. Wien. Med. Zts., viii. 18, 19, 1863. Schmidt's Jahrb., Band cxx. 299, 1863.)

The Anatomy and Physiology of the Heart, since 1860. By Professor F. W. Theile, of Weimar. (Schmidt's Jahrb., Band cxxi. pp. 92–138, 1864.)

QUARTERLY REPORT ON SURGERY.

By John Chatto, Esq., M.R.C.S.E.

I. *On Lithotomy and Lithotrity.* By Dr. J. Mason Warren. (Boston Med. and Surg. Journal, March 10.)

Dr. Warren, in this paper, gives an account of two cases of lithotomy which he recently performed on boys, the one by the ordinary bilateral procedure of Dupuytren, and the other a modification of his own. "The operation," he says, "combined some of the more important features both of the median and bilateral methods, and seems to offer some advantages over either. A sound of medium size was passed into the bladder; the meatus urinarius, which had become very much contracted, being just slightly enlarged by the knife. The skin was then divided in the median raphe, and the dissection continued in the same line until the membranous part of the urethra was exposed. This was next opened, and the attempt made to introduce the double *lithotome caché* of Dupuytren. Owing to the unyielding condition of the neck of the bladder, the *lithotome* could not be readily passed in, and a probe-pointed bistoury being substituted for it, the prostate was divided on both sides. The finger now entered with ease, and a large stone was felt very high up in the bladder. Attempts were made to extract it with a long pair of polypus forceps, and then with the ordinary lithotomy forceps, but without success, owing to the great size of the stone. The cut in the prostate was therefore enlarged, and the attempts at extraction renewed, but still unsuccessfully. As it was not deemed safe to enlarge the incision in the prostate farther with the knife, the two forefingers were introduced back to back, and the substance of the gland slightly torn. A larger pair of forceps was then passed in, and by embracing the whole stone within its jaws, it was extracted (measuring $3\frac{1}{2}$ by $2\frac{3}{4}$ in., and weighing $\frac{1}{2}$ oz.) without farther difficulty." Dr. Warren says that he was led to perform the operation in this manner "from having observed how easily these parts could be dilated in the incisions practised in perineal section for the division of strictures, in some cases impassable by the smallest sound. In these cases, after cutting through a deep perineum filled with inflammatory exudation, it is often found necessary to exercise much patience, and to spend much time in tracing the urethra beyond the stricture. Having had occasion, during the past few years, to do a number of these operations, most of them entirely without any guide, I was led to the reflection that it would be very easy in this way to perform the operation of lithotomy, when the operator is guided by the presence of a large staff in the urethra. When the operation by this median section is performed deliberately, the operator has the parts divided freely open to his view, which is not the case in Dupuytren's operation, which has to be performed mainly by the sense of touch. By this method, also, the vessels are much less likely to be wounded than in the common operation. Although different kinds of operations must of necessity be practised to suit different cases, the present method would seem to be the most direct and natural one for arriving at the bladder."

Since performing it, Dr. Warren has found that a similar operation had been suggested by Mr. Erichsen, who had not, however, performed it upon the living subject. Mr. Allarton's and Mr. Beaumont's operations, although done in the median line, are essentially different. Dr. Warren, speaking upon the subject of stone in general, says that, of about thirty cases he has operated upon, he has not lost one. Most of the operations performed were lithotrity, lithotomy being almost confined to the young. He has an excellent opinion of the former operation, when executed with discrimination and delicacy of manipulation; and he has often done it at his own house without more inconvenience to the patient than ordinary catheterism. "Care should be taken not to move the instrument too much about in the bladder, for the purpose of exploration. By sinking the beak of the lithotrite into the fundus of the bladder, opening it, and giving it a slight vibratory motion, the stone will generally fall within its jaws. It should then be raised to the middle of the cavity of the bladder, to make sure that the mucous membrane is not engaged, and the stone crushed by turning the handle. This may be repeated once or twice, but not more than five minutes should be occupied by the whole operation." As a general rule, Dr. Warren only operates once a-week, except when the irritability is very slight, when he sometimes does so twice. As long ago as 1849 he recommended the employment of ether, large quantities of this substance being required to sufficiently bring these patients under its influence, and annul the contraction of the bladder. It seems that calculous diseases are on the increase in Boston, uric acid being the most frequent ingredient of the stone, and next the triple phosphate.

II. *Polypi of the Rectum in Children.* By M. Guersant. (Bull. de Thérap., April 30.)

This is far from being a rare disease, for M. Guersant meets in private or hospital practice from six to eight cases every year. Generally the polypi are found just above the sphincter, but at some autopsies they have been met with higher up, and in one case even in the cæcum. Scarcely ever exceeding a small nut in size, they are usually found solitary and pediculated. The pedicle is more voluminous in recent polypus, and is composed of the mucous membrane which covers the hypertrophied mucous follicle constituting the substance of the polypus. Generally soft and bleeding, the polypus is sometimes tolerably firm and resistant. The symptoms are signicative, the child passing blood at stool, and especially at the end of the effort, and there are frequent desires to go to stool without any dejection taking place. When the fæcal matters voided are hard, they may be found grooved as a consequence of the pressure exerted by the polypus during their passage. If the amount of blood lost be not excessive, the health may not suffer for a long time; but when this is great, the child becomes pale and chlorotic. Generally, if the child be examined after going to stool, a red tumour is observed at the orifice of the anus, which returns after the evacuation, and this is usually mistaken by the friends for prolapsus ani or for a hæmorrhoïd, which M. Guersant has never met with in these young subjects. The form of the extruded tumour and its pediculated condition distinguish it easily from the prolapsus, especially if it be followed into the rectum by the finger, when it is usually found fixed to the posterior side of the rectum, and on pressing it, it slips from under the finger like a cherry-stone. The affection is often mistaken, the child being sometimes treated for dysentery; and when the pedicle is thin, the polypus may be separated during the passage of the fæcal matter, and discharged, a spontaneous cure being thus produced. Ordinarily, however, the pedicle is firmer, and the polypus continues to reappear after each stool. Although the prognosis is very favourable, surgical interference should always be resorted to, and the more promptly in proportion to the amount of blood lost. The operation is very simple. An enema is given, and the tumour usually appears when the last portion of this has been returned. It is seized with a forceps, and a silk ligature passed around its pedicle. It is frequently discharged at once; but if not, the ligature is allowed to pass into the rectum with the polypus, which then comes away in the evening or next day. Having met with considerable hæmorrhage from the use of the scissors, M. Guersant regards the ligature as the preferable means. Sometimes the polypus has to be brought down to the anus by means of the finger, and when this is rendered difficult by its slipperiness, a small polypus forceps should be passed in by the finger, and the tumour brought down by their aid, or, what is better, submitted to torsion without bringing down. Any hæmorrhage that follows may be arrested by cold-water injections or rhatany enemata.

III. *On the Divulsion of the Epiphyses.* By M. Foucher. (Congrès Médico-Chirurgical tenu à Rouen, 1863.)

The following are M. Foucher's conclusions: 1. The epiphysis may separate from the diaphysis either traumatically or spontaneously, being in the latter case but an epiphenomenon supervening in the course of other affections, especially of the periosteum. 2. Traumatic divulsion is more easy of production in proportion as the child is young, all things being otherwise alike. 3. The place of the separation of the epiphysis and the diaphysis varies according to the age and cause. There are three points of election—the union of the cartilaginous and the spongy layers, the union of the spongy layer and the spongy tissue, and the spongy tissue itself. 4. Whichever be the seat of the lesion, it resembles in its nature the solutions of continuity fractures, while in the mechanism of its production it is allied to dislocations. 5. The exaggeration of certain movements is, in fact, the most common ordinary cause of divulsion of epiphyses, muscular action only exercising a secondary influence. 6. The surface of the solution of continuity is alternately convex and concave, and the periosteum is largely detached from the diaphysis. 7. Divulsions may be either extra- or intra-articular — a matter of importance as regards prognosis.

IV. *On the Strangulation of Hernias.* By M. Chassaignac. (Gazette Médicale, Nos. 8, 9, 11.)

M. Chassaignac is of opinion that the views generally entertained with respect to the production of strangulation in hernia are to a certain extent erroneous, and, as the result of an investigation into the subject, he arrives at the following conclusions: 1. Neither of the two generally accepted doctrines concerning the anatomical cause of strangulation (both of which assume an uniformly circular constriction, whether produced by the neck of the sac or the fibrous rings) will withstand the test of rigorously observed facts; 2. The initial cause of strangulation exists almost constantly in the form of the sharp cutting edge of the aponeurotic ring which, through the neck of the sac, gives rise to a kind of depression (*encochûre*) in the intestine, which is more or less congested and accumulated in the sac; 3. I only regard a hernia as strangulated when there is complete interception of the intestinal permeability, characterized by vomiting of matters of the small intestine. I have never seen, and do not believe in, the rejection of those of the small intestine,—the fæcal odour, which may or may not be present, being due to imbibition. 4. Every hernia which becomes strangulated has existed for a more or less lengthened period, whether perceptible or not; and this existence of the hernia prior to strangulation explains the sigmoïd form of the hernia, its position in the sac, and the configuration of the ring surrounding it. 5. Among the causes of the sigmoïd or bent form of hernias may be noted the unequal resistance offered at different points of the walls of the bed within which the hernia becomes developed, the weight of the hernia, and the pressure exerted upon it by the integuments. 6. This bent position of the hernia exercises a notable influence on the commencement of strangulation by becoming a cause of difficulty in the transit of the contents of the intestine. 7. In a great number of instances of completely strangulated hernia, as soon as the sac has been opened, and prior to any *débridement,* a sound of ordinary size may be passed by the interior of the neck of the sac into the peritoneum, providing it be not attempted to slide it in on the side on which the sharp notch exists. 8. When strangulation has lasted long enough to leave traces of its existence on the surface of the intestine, these are never found to be uniformly circular, but localized more in some places than in others. 9. The point which has undergone most change always corresponds to the most cutting part of the aponeurotic ring. 10. Scarcely ever is the neck of the sac free and moveable within the ring. There is always a narrow and tight point of juxtaposition between the neck of the sac and the sharp edge of the ring. 11. No *débridement* can be effectual which does not act upon this point, or in its immediate vicinity. Otherwise, although the ring may be sensibly widened, the hernia still remains hooked within the notched edge. 12. In some cases strangulation of hernia is due to a pure circular constriction. 13. In the great majority of cases, however, the strangulation arises from the action of the sharp edge of the ring upon the hernia. This is shown by (1) the reducibility of certain strangulated hernias by *débridement* external to the sac; (2), by the existence of strangulated hernias without sac, and certain forms of internal strangulation; (3), by the permeability at some point of the neck of the sac prior to *débridement;* and (4), the localization of the impression produced by the constriction.

V. *On Syphilis of Muscles.* By Dr. Mazzuchelli. (Annali di Medicina, February.)

Dr. Mazzuchelli terminates a prize essay upon this subject with the following conclusions:—1. The history of muscular syphilis can be traced back to the epoch of the importation of syphilis into Europe. 2. Both the voluntary and involuntary muscles may become the subjects of constitutional syphilis. 3. The muscular affection is one of the late symptoms of syphilis. 4. Syphilitic muscular rheumatism, contractions, and paralysis, may occur without any sensible organic changes being present. 5. When organic lesion is present it assumes the form of fatty degeneration, almost always taking its point of departure from the interstitial cellular tissue. 6. The muscular fibre then atrophies and degenerates. 7. The muscular fibre may, however, become primarily softened. 8. In all cases in which the fibre itself has not disappeared, by the aid of mercury and iodine the muscle may be entirely restored to its normal condition.

VI. *On the Removal of the Tonsils.* By M. Guersant. (Bull. de Thérapeutique, March 30.)

Although in many cases the surgeon must promptly decide upon an operation, his intervention is not always required,—time, the efforts of nature, and the operation of various medicinal agents being sometimes, when perseveringly employed, efficacious. But in order to relieve children promptly of their ailment we must resort to excision, and thus avoid the inconvenience of repeated local applications, which are, in fact, so many operations inducing irritation and convulsive accidents that sometimes prove fatal. Still the operation should not be resorted to unless the child is seriously inconvenienced by the tonsil, nor unless he is in a good state of health. It should especially be avoided when there is any pseudo-membranous exudation on the tonsil. Some preparatory treatment may be usefully employed in children who are liable to hæmorrhage, such as the use of astringent gargles, or even the internal administration of perchloride of iron. A mustard foot-bath the evening before, and abstinence from food on the morning of the operation, are necessary. It is also useful to accustom the child a day or two before to have its tongue kept down. But at the time of the operation M. Guersant eschews all instruments to keep it down, or cork between the teeth, as impeding the manœuvres. The great thing is to have the child firmly held between the legs of an assistant, who with his left hand should keep the head firmly pressed against his chest, and with his right hand secure both hands of the patient. Whatever the age of the child he must be held vigorously, no reliance being placed upon his apparently little power of resistance.

The tonsillotome employed must be proportionate in size to the age of the child, it being better to have one too small than too large. That employed by M. Guersant has the aperture smaller and more oval than usual, so that the tonsil can be more readily engaged in it when passed behind the velum. He also has two in readiness, so as to be able to at once proceed to the excision of the second tonsil. The tongue is kept down by the ring of the instrument introduced onits flat side, this being then turned to the right or left, according to which tonsil has to be removed. When, from want of practice, the operator has only shaved off a portion of the surface, it is better not to trust to this, but to at once fix the instrument on again. Although in this operation there is no danger of wounding the carotid, hæmorrhage may as readily occur as when the bistoury is used. It is, however, very rare in children, for in more than a thousand operations upon children M. Guersant has not met with it in more than three instances, while among twelve or fifteen operations performed on adults he has found serious hæmorrhage in four or five, requiring the actual cautery or the perchloride. In most cases, cold water acidulated with lemon-juice or vinegar suffices to arrest the bleeding, or a pencil dipped in lemon-juice mixed with alum may be carried to the part whence the blood flows. The most certain remedy is a point of actual cautery at a white heat, but the means which M. Guersant always finds efficacious is the application of a small plug of amadou soaked in perchloride diluted with one-third of water. Another very useful means, which may often be used in conjunction with the above or render them unnecessary, is the application of bruised ice externally by means of a vulcanized caoutchouc necklace made by Galante. There is always a more or less considerable flow of blood, but after the patient has spat awhile and gargled his throat well, this should cease. As young children do not spit they swallow the blood, and afterwards reject it by vomiting or pass it by stool, causing groundless alarm. Exposure to the cool air, together with cool drinks, will usually soon stop all bleeding, and for the first day only cold milk or cold broth should be given as food, aliments easy to swallow being also selected for some time to come. The child should be prevented speaking for a week. The wound will always be found covered with false membranes which do not possess a diphtheritic character, but which separating on the fourth or fifth day give rise to some bleeding that may be more considerable when the child, by cries, singing, &c., has detached them prematurely. These consecutive hæmorrhages are arrested by acids and cold applications; but quietude and silence on the part of the patients are very important. These membranes must be carefully watched, and sometimes their detachment may be facilitated by touching them with lemon-juice.

The definitive results of excision of the tonsils are often very remarkable. Deaf children are sometimes able to hear after the operation, some who spoke badly frequently pronounce much better, and singers gain much in clearness of voice, although, in this last respect, if some adult singers have gained by the operation, others have lost. Finally, and this is one of the most marked advantages gained, children with contracted chest are enabled to respire better, the depressed ribs often regaining their normal condition, the chest gaining its amplitude, and the entire economy benefiting in consequence.

VII. *Case of Ulceration of the Femoral Artery.* By M. Richet. (Gaz. des Hôp., No. 21.)

M. Richet related to the Paris Surgical Society a remarkable case, in which ulceration of the femoral artery, at three centimetres above the spot at which a ligature had been applied, was accidentally discovered on the dissection of a stump forty-nine days after amputation, no symptom having resulted from the ulceration. The patient, sixty years of age, underwent amputation for white swelling on the 12th December, and he died of pulmonary phthisis on the 1st February. The ligature of the femoral artery encountered some difficulty, the vessel being large, and its walls rigid from ossification. No secondary hæmorrhage, however, occurred, and although the stump re-opened after having been healed up, the bone protruding, there was no bleeding. At the autopsy, the lower end of the femoral artery was found obliterated by a coagulum, but at three centimetres above this there existed an ulceration two millimetres in diameter, arising from the atheromatous condition of the wall of the vessel. The soft parts being completely cicatrized for more than a centimetre below the vessels, no blood could issue externally at the time of the arterial rupture. A diffuse aneurism might have ensued, or, more probably, a communication between the artery and the femoral vein would have taken place, as the wall of the latter, when in contact with the artery, had undergone considerable thinning.

VIII. *Summary.*

Abscess.—Dolbeau, Case of Submaxillary Abscess. (Gazette des Hôp. 49. Interesting from the occurrence of arterial hæmorrhage, requiring ligature of the external carotid.)

Amputation.—Lidell, Major Amputations for Injuries. (American Quarterly, April. The author adduces the experience of the American war in favour of the superiority of primary amputation.)—Gross, Successful Case of Amputation at the Hip-joint. (American Quarterly, January.)—Middeldorpff, Galvano-caustic Amputation of the Penis. (Archives Gén. May and June. Thirty-three cases adduced to show the superiority of this mode of procedure.)

Aneurysm.—Parker, Case of Subclavian Aneurysm. (American Medical Times, March 5. Ligature of the left Subclavian inside the scalenus, together with the common carotid and vertebral arteries; hæmorrhage from distal end of the subclavian; and death on the forty-second day.)—Lidell, Traumatic Aneurysm from Gun-shot Wounds. (American Quarterly, January. Two very interesting cases, the one of axillary aneurysm, for which the subclavian was tied; and the other of femoral aneurysm, for which ligature was employed after compression had failed.)—Janssens, Treatment of Aneurysm by Compression. (Bull. de l'Acad. de Méd. Belgique, No. 2. Janssens relates two cases of aneurysm at the upper part of the thigh, treated by compression by Rizzoli of Bologna, by means of a new compressor, which is figured.)—Gherini, Treatment of Aneurysm by Compression. (Annali Universali, March. Four cases of aneurysm of the ulnar artery successfully treated by compression.)

Anthrax.—Smyly, Treatment of Anthrax by Pressure. (Dublin Quarterly Magazine.)—O'Ferrall, Treatment of Anthrax by Pressure. (Dublin Medical Press, March 9. O'Ferrall states his conviction that this mode of treatment, introduced by him five years since, is the most effectual procedure, and has properly superseded incision.)

Anus.—Melchiori, Fissure of the Anus. (Annali Universali, February. 24 cases related, 16 occurring in women, and 9 in men; in 13, parturition seems to have been the primary cause, while several of the others were subjects of constipation. The author has found the best treatment to consist in forced dilatation by means of two fingers, and the subsequent application of nitrate of silver to the fissure. In irritable subjects, belladonna ointment and cold sitting-baths should be employed.)—Debout Prothesis, in Artificial Anus. (Bull. de Thérapeutique, March 30.)—*Vide* Rectum.

Bone.—Blasius on Osteogymnosis. (Deutsche Klinik, No. 9. Gives an account of denudation of bone existing independently of caries and necrosis.) —Wahl. and Wulftt, Necrosis of Phosphorus Workers. (St. Petersburg, Med. Zeit., No. 4.)

Cataract.—Frobelius, Unusual Cases of Extraction and Modification of the Operation. (St. Petersburg Med. Zeit., No. 1.)—Blessig, on Extraction of Cataract.—(Ibid. No. 3. Relates to the extractions performed in the St. Petersburg Ophthalmic Hospital, 1860-63. These were 133 in number, the operation in 34 being combined with iridectomy.)—Wecker, On the Operation for Senile Cataract. (Congrès Med. Chir. tenu à Rouen, 1863.)

Diplopia.—Dousmani, Experimental Researches on Minocular Diplopia. (Archives Gén., April.)

Dislocation.—Guerin, Separation of the Forearm during Reduction of a Dislocation of the Humerus. (Gaz. des Hôp., Nos. 36 and 39. The dislocation was of three months' date, but no violence was used. Discussion on the subject at the Surgical Society of Paris.)—Fortin, Dislocation of Femur in Young Children. (Congrès Med. Chir. tenu à Rouen, 1863. Fortin has made many admeasurements both in the dead and the living, in order to ascertain the exact normal position of the trochanter, as an aid to diagnosis in luxation.)—Von Thaden, Fracture of the Great Tuberosity in Dislocation of the Humerus. (Langenbeck's Archiv, vol. vi. No. 1.)

Drainage.—Ciniselli on Surgical Drainage. (Annali Universali, May. An attempt to simplify the application of the drainage tubes.)—Kidd, Drainage Tubes in Effusions into the Pleura. (Dublin Quarterly Mag.)

Ear.—Schwartze, Disease of the Ear as a consequence of Measles. (Journ. für Kinderkrank, March.)

Excision.—Doutrelpont, Excision of the Elbow. (Langerbeck's Archiv, vol. v. No. 1. The author adds 20 cases to the 333 already on record, and expresses a highly favourable opinion of the operation.)

Eye.—Stellwag von Carion on the Sparkling Eye. (*Leuchtende Auge*, Wien Wochenschrift, Nos. 10, 11, 12.)—Galezowski, Flocculi of the Vitreous Body. (*Synchisis Floconneuse*, Annales d'Oculistique, February.)

Foot.—Eulenberg, Deformity of the Foot from Traumatic Paralysis of the Peroneal Nerve. (Greifswald Beiträge, vol. ii. No. 2. Two cases related the result of injury to the knee, and others referred to due to luxation, or other traumatic causes, acting at or near the knee-joint. The author calls attention to paralysis of this nerve, and consequent deformity, but usually only temporary, as almost a constant result of excision of the knee.)

Fracture.—Drake, Fracture of Radius from Indirect Violence. (Prag. Vierteljahrs. No. 2.)—Zeis on Union of Intracapsular Fracture of the Neck of the Femur. (Nova Acta of Leopold. Acad. vol. xxx. In this paper the author enters into a critical examination of hitherto published cases, and gives a minute anatomical description of two illustrative preparations.)

Glaucoma.—Magawby, Report on Glaucoma. (St. Petersb. Med. Zeit., No. 4. Reports on 158 Cases of Glaucoma, occurring in 95 patients treated at the St. Petersburg Ophthalmic Hospital in 1860-63.)—Homberger, Epilepsy of the Retina and its Connexion with Glaucoma. (American Journal of Ophthalmology, vol. ii. No. 1.)

Gun-shot Wounds.—Hamilton, Treatment of Gun-shot Wounds of the Head, Chest, and Abdomen. (American Med. Times, Nos. 6 to 22.)—Moses, Surgical Notes of Cases of Gun-shot Wounds, (American Quarterly, April.)—Verneuil, Excision of the Knee in Gun-shot Wounds. (Gaz. des Hôp., Nos. 54 and 56.—Verneuil relates two successful cases occurring in civil practice, but at the discussion which took place at the Surgical Society, the army surgeons threw great doubts as to the applicability of the practice in military service.)

Hæmorrhoïds.—Hamilton, Treatment of Piles by the Ecraseur. (Dublin Quarterly, May.)

Hernia.—Zeis, some Rare Occurrences in the Operation for Hernia. (Langenbeck's Archiv, vol. v. No. 1.)—Fiedler, Operation in a Case of Empty Sac, with Symptoms of Strangulation. (Archiv der Heilkunde, No. 3.)—Goyrand, Three Cases of Ileus arising from Non-strangulated Hernia, requiring Operation. (Bull. de Thérap. March 15th. Goyrand relates these cases as illustrative of the position that the distension of the hernia and intestinal canal by gases or feculent matters may, quite independently of strangulation, give rise to ileus, necessitating an operation.)

Iridectomy.—Homberger, New Mode of performing Iridectomy. (American Journal of Ophthalmogy, vol. ii. No. 1.)

Jaw.—Bottorio, Case of Subperiosteal Excision of the Lower Jaw. (Annali Universali, February.)

Joints. — Velpeau, Treatment of Hydarthrosis by Iodine Injections. (Gazette des Hôpitaux, No. 44. Two cases exhibiting the advantage of M. Velpeau's practice of treating chronic disease of the joints by iodine injections.)

Lithotomy.—Jarjavy, Case of Encysted Calculus Removed by Bilateral Lithotomy. (Gaz. des Hôp., No. 33.)

Lithotrity.—Stilling, Nine Cases of Lithotrity. (Deutsche Klinik, Nos. 4 and 14.)—Courty, Lithotrity performed in a Single Séance. (Congrès Méd. Chir. tenu à Rouen, 1863.)

Mastoïd Process.—Zoja, Researches on the Mastoïd Process. (Annali Universali, May. An extensive examination of the mastoid process and its cells, in relation to the question of trephining.)

Neuralgia.—Warren, Neuralgic Affections following Injuries of Nerves. (American Quarterly, April.)—Gherini, Surgical Treatment of Neuralgia. (Annali Universali, April. The author, after referring to many cases of excision of portions of various nerves, admits that the operation cannot be regarded as a curative procedure, although it proves useful as a palliative.)

Ophthalmia.—Discussion on Military Ophthalmia. (Bull. de l'Acad. de Méd. de Belgique, No. 1. It has been repeatedly stated that the so-called military ophthalmia has ceased to infest the Belgian army, but the Academy still continues its interminable discussions on the subject.)

Ophthalmoscope.—Rosebrugh, New Ophthalmoscope for Photographing the Posterior Internal Surface of the Living Eye. (Canada Journal, March.)—Homberger, Practical Hints on the Use of the Ophthalmoscope. (American Journal of Ophthalmology, vol. ii. No. 1.)—Giraud-Teulon, New Procedure of Binocular Ophthalmoscopy. (Congrès Méd.-Chir. tenu à Rouen, 1863.)

Ovariotomy.—Von Dusch on Ovariotomy. (Archiv Vereins für wiss. Heilkunde, No. 2. Von Dusch narrates a successful case, preceded by a general review of the subject.)—Reeve, Two Successful Cases of Ovariotomy. (American Quarterly, April. These cases occurred in the practice of Dr. Dunlop, who first undertook the operation in 1843, and has now performed it 19 times, with 15 recoveries and 4 deaths.)

Paralysis.—Bachon, Paralysis of Radial Nerve. (Recueil de Méd. Militaire, April. This affection has been frequently observed among the water-carriers of Rennes, and is produced by their mode of carrying their heavy buckets.)

Perineoraphy.—Launay on Perineoraphy. (Gaz. Méd. Nos. 10, 12, 13. Launay gives a review of the various forms of this operation which have been devised, (not noticing, however, any of those by English surgeons), and describes a new modification devised by M. Demarquay.)

Plastic Operations.—Préterre, Plastic Operations on the Palate and Jaws. (Congrès Med.-Chir. tenu à Rouen, 1863.)—G. Simon on Uranoplasty. (Greifswald Beiträge, vol. ii. No. 2. A critical review, and several new cases, the restoration of clear speech without a nasal tone being especially the object held in view.)

Polypus.—Debrou, Laryngo-tracheotomy for a Large Polypus of the Larynx. (Gaz. des Hôp. No. 46.—Deroubaix and Michaux on Operations for Removal of Naso-Pharyngeal Polypi. (Presse Méd. Belge, Nos. 16, 17, 18, 26.)—Mathieu, A Multiple Abraseur for Polypi of Larynx. (Union Méd., No. 44.)

Pyæmia.—Von Wahl, Contributions to Clinical History of Purulent Diathesis and Septic Infection. (St. Pet. Med. Zeit., vol. v. No. 6.)—Dupuy, Theories of Purulent Infection. (Gaz. Méd., Nos. 16, 18. An able review of the various theories.)

Rectum.—Bumstead, Syphilitic Disease of Rectum. (American Medical Times, No. 21. Chiefly relates to syphilitic stricture of the rectum.)—*Vide* Anus.

Stricture.—Collis on Screwed Bougies in Stricture. (Dublin Quarterly, May.)

Teeth.—Neumann, Nature of Caries of the Teeth. (Langenbeck's Archiv, vol. v. No. 1.)

Testis.—Debout, Employment of Bandages in Secondary Displacement of the Testis. (Bull. de Thérap., Feb. 29 and March 15.)

Urethra.—Watson, Cases of Injury of the Urethra. (Edinb. Med. Journal, April.)

Uterus.—Warren, Successful Operation for Elongated Cervix Uteri. (American Quarterly, January. This was a case of hypertrophic elongation as described by Huguier, of twenty-six years' duration, projecting beyond the external parts, and attended with ulceration and hæmorrhage.)

Veins.—Greene, Presence of Air in the Veins as a Cause of death. (American Quarterly, January. A very good critical appreciation of facts already on record.)

QUARTERLY REPORT ON MIDWIFERY.

By Robert Barnes, M.D. Lond., F.R.C.P.,
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I. Labour.

1. *Proctocele Vaginalis as an Obstruction to Labour.* By Dr. E. A. Meissner. (Mon. f. Geb., 1863.)
2. *Pelvic Tumour, with loosening of the Pelvic Bones.* By A. H. Swaagmann. (Nederl. Tijdschr. v. Geneesk., February, 1863.)
3. *On Difficult Labours; Forceps Cases.* By Dr. Halahan. (Dublin Quart. Journ., May, 1864.)
4. *On a New Case of Spondylolisthesis.* By Dr. Olshausen. (Mon. f. Geburtsk., February and March, 1864.)
5. *A Case of Natural Labour with an Extremely Obliquely-ovate Pelvis.* By Professor Litzmann. (Mon. f. Geburtsk., April, 1864.)
6. *A Cæsarian Section.* By Dr. Kuneke. (Mon. f. Geburtsk., May, 1864.)
7. *History of a Case of Cæsarian Section successfully carried out for Mother and Child.* By Dr. W. A. Freund. (Klin. Beiträge f. Gynäkol. Breslau, 1864.)
8. *Cæsarian Section on account of a Fibrous Tumour.* By Dr. Putegnat. (Journ. de Bruxelles, 1863.)
9. *Cæsarian Section, with Successful Result for Mother and Child.* By Dr. Frickhoeffer. (Würzburger Med. Zeitschr., 1863.)
10. *On a Case of Chronic Osteomalacia. Cæsarian Section in the Sixth Labour. Rupture of Uterus in Seventh Labour ending Fatally.* By Dr. Winckel. (Mon. f. Geburtsk., May, 1864.)
11. *On the Healing of the Wound of the Cæsarian Section, and a Proposal for the Diminution of the Danger of this Operation.* By Dr. Martin. (Mon. f. Geburtsk., May, 1864.)
12. *On a Hysterotomia Post-mortem.* By Dr. Devilliers. (Bull. de l'Acad. Imp. de Méd., 1863.)
13. *On the Comparative Claims of Craniotomy and the Cæsarian Section in a certain class of Labours, and on the use of a New Pelvimeter.* By Dr. Murphy. (Dublin Quart. Journ., May, 1864.)
14. *Fifty Cases of Artificial Premature Labour induced on account of Contracted Pelvis, the greater part by the method of Kiwisch (the Vaginal Douche): Considerations.* By Professor Lazzati, of Milan. (Annali Universali di Medicina, Milan, March, 1864.)

1. Under the name of "proctocele vaginalis," Dr. Meissner describes a case of descent of the intestines pushing down the vagina before the head, and so obstructing labour. The patient was at term in fourth pregnancy. The pelvis was obliquely distorted. Abdomen overhanging. But the next obstacle arose from a large soft tumour occupying the lower part of the vagina, which exploration by the rectum proved to be recto-vaginal hernia. Repeated attempts to push up this mass failed. Hiccough, vomiting, tympanitis occurring, with rapid acceleration of pulse, delivery was effected by forceps with some difficulty. The mother recovered.

2. Dr. Swaagmann relates an unusually interesting case of pelvic tumour complicating pregnancy. A woman, aged forty-three, was in her eleventh labour. Progress was obstructed by a firm, smooth tumour, the basis of which sprang from the right obturator foramen and horizontal ramus of the pubes; it stretched towards the promontory, and so contracted the inlet as to render forcible delivery necessary. Turning was performed with difficulty. The patient sank in fifty-eight hours, with symptoms of gangrene. The tumour was

a hard sarcoma containing several bony points. The ramus of the pubes partook of the character of the tumour springing from it. The left sacro-iliac symphysis was very moveable; the interosseous cartilage had quite disappeared. The symphysis pubis was so loosened and moveable that the finger could be easily laid between the bones. The right sacro-iliac symphysis was also moveable, but in less degree.

3. Dr. Halahan gives the results of three years' proceedings at the Dublin Lying-in Hospital as regards the resort to the forceps. In 3700 cases of labour, 56 women were delivered by forceps, the labours lasting from eight to seventy hours; 46 were primiparæ; 16 children were dead-born; 13 of the mothers died. Puerperal fever prevailed in the hospital, and this was the cause of the majority of the deaths; 22 women were delivered by the vectis, 17 were primiparæ; 7 children were dead-born; 4 mothers died. Inertia of the uterus was the indication for the use of the forceps or vectis in 58 instances; disproportion in 10, in 5 of which the crotchet had ultimately to be used. Dr. Halahan strongly dissents from the proposition that the forceps is beneficial in labour cases in which there is an immediate or prospective danger. (It is, however, legitimate to surmise that fewer women would have died had the instrument been used at an earlier stage.)

4. Dr. Olshausen records another case of the deformity described by Kilian under the name of spondylolisthesis. The patient, when eighteen years old, having been previously healthy and straight, was seized with sacral pains, and lost the power of straightening the spine. When twenty-four years old she became pregnant, and coming under the care of Dr. Olshausen, it was found that the conjugate diameter was reduced to three inches. The Cæsarian section was performed. Death followed on the fourth day of peritonitis. The skeleton, which is figured, showed the fifth and fourth vertebræ sunk down into the cavity of the pelvis, so that the conjugate diameter of the brim is represented by a line drawn from the pubic symphysis to the lower margin of the third lumbar vertebra. The last lumbar and upper sacral vertebræ were ankylosed. The entire sacral canal was open behind as in a case of complete sacral spina bifida. An interesting feature in this case is the fact that the disease, causing the slipping down of the lumbar vertebræ, began in adult age. This circumstance is in opposition to the theory of Lambl and others, who assign to the deformity a congenital origin.

5. The body of a woman, with highly-marked obliquely-ovate pelvis, was brought to the dissecting-room at Kiel. Dr. Litzmann ascertained that she had passed through a natural labour in the Kiel Lying-in Hospital two years before. He gives a minute description of the pelvis, and discusses the origin of this deformity, and its influence upon the mechanism of labour. The memoir is very full and elaborate, and contains much valuable information upon this subject. The sacrum throughout the entire auricular surface was anchylosed to the right os innominatum. The sacrum of the right side was much narrower than the left half. The right innominatum was distorted upwards, backwards, so that the crest was on a higher level than the left. The symphysis pubis was completely driven over to the left. A perpendicular drawn from the promontory of the sacrum cut the middle of the right horizontal ramus of the pubes. The right ischium was also twisted upwards, backwards, and inwards. The following measurements are given:—Conjugate diameter 4″ 7‴, transverse 4″ 11‴, right oblique 5″ 7‴, left oblique 3″ 7‴, right sacro-cotyloïd 2″ 3‴, left sacro-cotyloïd 4″ 4‴. Hence there was a difference of two inches in the two oblique diameters.

The patient had not suffered from rickets. There was no marked spinal curvature. She used both legs freely. No evidence of inflammation of the bones was found. Litzmann therefore concludes that the deformity arose in a primary defective formation of the right sacrum, which disturbed the centre of gravity. The anchylosis he regards as secondary, in opposition to Simon Thomas, who considered anchylosis the primary condition.

6. A woman of Kurhessen, aged seventeen, of small stature, had suffered from rickets, was admitted at Göttingen in her first pregnancy. The Cæsarian section was performed. The child was extracted alive; the membranes being opened by the incision; the bleeding was very slight; the uterus contracted strongly; the abdominal wound also contracted, so that only three stitches were necessary. She died nine hours after the operation. The autopsy revealed between the abdominal walls and the uterus a mass of coagulated blood. Behind this lay the uterus, a foot long, quite relaxed, the wound gaping. The incision ran through the lower third down to an inch and a half of the os uteri externum. There were clots in the cavity of the uterus. The conjugate diameter measured two inches and a half.

In the Academical Lying-in Hospital of Göttingen, the Cæsarian section has been performed six times in 8437 labours. All the mothers died, two children were saved.

7. Dr. W. A. Freund relates a successful case of Cæsarian section. The patient was twenty-four years old; had learned to walk very late. She had aborted at sixteen; her height was four feet. There was considerable curvature of the spine. The conjugate and diagonal diameters of the brim each measured about two inches. The child was alive, and the patient herself in excellent health. Labour began at term in June, 1862. The Cæsarian section was performed. The wound in the uterus was about five inches long. A rather free parenchymatous bleeding took place; but the placental seat was not injured. The child was extracted crying. The uterus instantly contracted strongly, and the placenta appeared at the wound. The abdominal wound was dressed by strips of plaster crossed. The after treatment consisted in giving opiates to allay pain, and ice to the wound. The pulse rose to 96 on the following day, then declined, and in four weeks the patient had quite recovered. The author insists upon the utility of applying ice as soon as the first symptoms of peritonitis appear.

8. Dr. Putegnat says he has found only two cases of pelvic tumours by Puchelt, impeding delivery. These he compares with two cases observed by himself. In one case the author found the perinæum so enormously distended that he found the head would make its way between the anus and the vulva. An immense tumour was felt on the right side; it was painless, moveable, elastic, lying on the anterior surface of the sacrum, filling the pelvis and rising above the brim. There remained only a very contracted space between the tumour and the symphysis pubis. The distension of the perinæum was caused by the tumour. The Cæsarian section was performed; a living child was extracted. The mother died in forty-eight hours of gangrenous peritonitis. The tumour was fibro-cellular, oval; the stalk had a circumference of fifty-five millimetres, and was attached to the obturator ligament and the ligament of the tuberosity of the sacrum, and also to the descending ramus of the pubis. It was of the size of a child's head. It must have grown within eighteen months, as that time previously the woman had been delivered by forceps.

9. Dr. Frickhoeffer relates a successful case of Cæsarian section, performed in January, 1863. A woman, aged thirty-one, had borne three children without help, although contraction of the brim was known to exist. She had suffered much from pains in the back and pelvis, increasing since the second labour. Towards end of gestation, symptoms of exhaustion, vomiting, &c., set in; the pelvis was much contracted in all dimensions; three fingers could

hardly be inserted between the tubera ischii. The os uteri could not be reached. The Cæsarian section was performed fifty-two hours after escape of liquor amnii, under chloroform. Obstinate vomiting followed extraction of child; collapse lasted several hours. Recovery progressed without signs of peritonitis.

10. Dr. Winckel, whose extraordinary experiences of osteomalacia and the Cæsarian section have attracted so much attention to Gummersbach, where osteomalacia seems endemic, relates an interesting case of this disease. The patient had borne four children easily; the fifth was delivered, after a severe labour, dead, osteomalacic disease having set in. On the 2nd September, 1860, she was delivered of a sixth child by the Cæsarian section. She suckled it more than a year. In December, 1863, being pregnant the seventh time at term, she died undelivered, the uterus having ruptured. It was found that *the rent was in the seat of the scar.* The ovum was expelled entire into the abdominal cavity. The peritoneal covering of the uterus was unequally, but much thickened posteriorly. The anterior peritoneal covering was only thickened in stellate patches. In some points the peritoneum was strongly pushed outwards. Around the cervix was a quantity of exudation-membranes, which especially in front were strongest, and bound the uterus to the bladder. The tubes and ovaries were quite free. The uterine muscular structure was strongest in the middle of the scar; it became suddenly much thinner, and at the lower end was less than half-an-inch thick. The placenta had grown to the anterior wall along the course of the scar. The os uteri internum was a small ring. In the ruptured scar-wall were seen large gaping vessels. The woman had probably died of the copious bleeding from these vessels. Winckel says, usually these scars are destitute of blood-vessels, and in several similar cases the escape of blood has been inconsiderable on the escape of the child into the abdomen.

The pelvis measured 3″ 3‴ in conjugate diameter, and all the measurements were contracted.

The most remarkable feature of this pelvis, says Winckel, was that there remained no trace of softening. A complete re-ossification had taken place. The bones were more massive, harder, than in the normal pelvis. The ossific process was so active that osteophytic formations were produced on several points. There was, therefore, in this instance, one of those rare cases of complete recovery from osteomalacia—an event so rare that some deny that it ever occurs.

11. Referring to the preceding case, Martin says that in most cases of uterine section, the outer layers of the incision retract, and only the inner layer remains in apposition when the operation is completed. Hence the frequent thinness of the scar predisposing to rupture. On the other hand, in several successful Cæsarian sections, in which subsequent pregnancy was not followed by rupture, but in which the uterus was either opened again by Cæsarian section, or in which premature labour was induced, autopsies showed adhesions between the uterus and the abdominal walls.

Martin proposes to unite the uterine wound with the abdominal walls directly by the sutures, so as to favour formation of adhesions.

12. Dr. Devilliers relates a case of a woman who having had several severe labours, and heart disease, died at term of gestation suddenly, from bursting of an aneurysm. The Cæsarian section was performed thirty to thirty-five minutes after death, the operation lasting seven to eight minutes; the child was extracted from forty to forty-five minutes after the mother's death. It was alive, but did not breathe fully, and died in forty minutes.

13. Dr. Murphy relates two cases of labour, in which the antero-posterior diameter of the pelvis measured $2\frac{1}{4}$ and $2\frac{1}{3}$ inches. The patients were brought

to University College Hospital with a view to delivery by Cæsarian section; but the children being dead, the crotchet was preferred. Delivery was effected, after the patients were much exhausted. Both died under symptoms of bronchitis. The conditions were verified by post-mortem examinations. Dr. Murphy argues that both cases prove the great danger of craniotomy, when the disproportion is so great, and seem to justify the rule that when the conjugate axis of the pelvis is two inches or less, the Cæsarian section should be performed *to preserve the child.*

14. In an elaborate memoir Professor Lazzati relates in detail the histories of two cases in which he induced labour by the vaginal douche. Both ended fatally. This led him to analyse closely the histories of other cases in which this method was employed in the Milan Hospital, and in private practice in the town. He dwells upon the objections urged against the operation by Robert Barnes, Dessant, Esterle, Germann, and Braun. These and other authors cite cases in which death was directly traced to the method.

Lazzati classifies his cases into two tables. In Table A. are 36 cases. 30 of these occurred in the Milan Lying-in Hospital; 6 in private practice in town. The number of injections ranged from 1 to 12. The quantity of water used in one injection was about 40 pints. The time of each injection was from 10 to 15 minutes. The interval elapsing from first injection to labour was from one day to fourteen; the average, four days. In 9 cases, turning was employed to deliver; in 5, the forceps; in 1, craniotomy: 12 *mothers, or one-third died!* 13 children, or more than one-third, were still-born.

In Table B. are 14 cases, of which 10 were in hospital. In all, labour was induced in the 8th month. In 6 the method employed was puncture of the membranes; in 6, the sponge-plug; in 2 the placing an elastic bougie in the uterus. All the mothers recovered. Three of the children were still-born.

In discussing the question, Was the method adopted the cause of the unfortunate result of his two cases? Lazzati answers in the affirmative. In one case the patient complained of acute pain in the pubic symphysis during an injection. She died with suppuration in the joints. Was the fatal result due to the mode and force employed in the injections? The instrument used was the Colpantlon of Braun. It has a considerable projecting force; and notwithstanding the utmost care, a considerable impulse against the lower segment of the uterus is unavoidable, predisposing it to congestion and inflammation.

(The latter objection has some weight. The quantity of water used and the propelling force seem to have been excessive. On the other hand, less water and less force imply greater uncertainty and tediousness. The evidence here adduced against Kiwisch's method is too serious to be disregarded, especially as that evidence is strengthened by the occurrence of several deaths—albeit unreported—which has followed the operation in this country.—R. B.)

II. The Puerperal State.

1. *On the Retardation of the Pulse in Puerperal Women.* By Dr. H. Blot. (Arch. Gén. de Méd., May, 1864.)
2. *On the Temperature Relations of Lying-in Women.* By Dr. v. Grunewaldt. (Petersb. Med. Zeitschr., 1863.)
3. *On Puerperal Fever.* By Prof. Buhl. (Mon. f. Geb., April, 1864.)
4. *Report of the Lying-in Institution at Jena for the Years* 1859-61. By Dr. Koch. (Mon. f. Geb., 1863.)
5. *Intra-uterine Perforative Peritonitis with a Hydrocephalic Child.* By Professor Breslau. (Mon. f. Geb., 1863.)

1. Dr. Hippolyte Blot has communicated to the Academy of Sciences an

interesting memoir on the pulse in lying-in women. From upwards of 300 minute observations made in hospital and in private practice, he draws the conclusion that a marked retardation of the pulse following delivery is a normal phenomenon. The following is a summary of his researches:

(1.) In *healthy* women a retardation of the pulse takes place in childbed.

(2.) The frequency of this phenomenon varies with the sanitary state: thus, if in a lying-in hospital a bad sanitary condition arise, this retardation is interfered with; it is therefore a test of the salubrity of an hospital; and when present, is a most favourable prognostic sign.

(3.) The retardation varied from 35 pulsations in the minute in one case, to 44 and 60 in others. Blot assumes the standard pulse of women to be 75.

(4.) It is more frequent amongst multiparæ.

(5.) The duration of the retardation varies from some hours to ten or twelve days.

(6.) The course pursued by the retardation is nearly always the same. It commonly begins during twenty-four hours following labour; goes on increasing; then is stationary, then gradually disappears. It often persists during the so-called milk-fever.

(7.) The length of the labour does not appear to exert much influence. But the slightest pathological condition either prevents it or puts an end to it. It is observed after abortion, and after premature labour.

(8.) Position, horizontal, sitting or standing, modifies it considerably. Sitting up will accelerate the pulse 15 beats.

(9.) As to the cause of this phenomenon, M. Blot agrees with M. Marcy in finding it in the increased arterial tension caused by the sudden suppression of the uterine circulation. This greater arterial tension becomes an obstacle to the ventricular systole, and hence the retarded pulse.

2. Dr. von Grünewaldt has made some interesting observations on the temperature of lying-in women in the Petersburg Lying-in Hospital. The subjects amounted to 432. He quotes Wunderlich as giving the mean of 98° F. as the temperature of lying-in women. Of 52 observations of women immediately after labour, the mean was nearly 99° F. Two hours later the mean was above 99° F. Within the first 24 hours the mean was 100° F. on 113 observations. Within seven days after labour, the mean temperature ranged from 98° to 99½° F. Hence, says Von Grünewaldt, puerperæ at their best are only relatively healthy. During the period of milk-fever, the temperature rises in 12 to 24 hours from 100° to 101½°; then quickly sinks to the normal standard. Any excess above 101° betokens evil. Strong rigors are followed by 104° F. or more. Painful excoriations of the nipples may cause a rise to 100° or 102°. He states the following general conclusion: "Every puerperal inflammatory process causes a rise of 7° to 8° F. above the normal. With the onset of the exudation process the temperature falls. In acute septicæmia, there are very rapid progressive rises until collapse takes place.

3. Professor Buhl advances the proposition that the first case of puerperal fever occurring in a lying-in hospital, which draws after it a series of other cases, is marked by severe traumatic injuries, as contusions, fissures, &c., of the cervix uteri or vagina, and the formation of foul, gangrenous wound-matters. He supports this by citing cases of traumatic injury to the uterus or vagina unconnected with parturition, which, nevertheless, were followed by pyæmic infection of the lymphatics, peritonitis, and other symptoms identical with those of puerperal fever. Puerperal fever then, he says, has nothing specific. It is nothing but pyæmia originating in the genital organs, just as it may arise from other parts.

(This reasoning is not conclusive, nor sufficiently comprehensive. It does not explain why the parts injured in labour should fall into a condition of gangrene. That this is really a form of hospital-gangrene that is due to hospital miasm, or some other form of hospital infection, cannot be doubted.—R. B.)

4. The account of the experience of the Jena Lying-in Institution given by Dr. Koch is but a repetition of the oft-told tale of sacrifice of life to a vicious system of charitable administration. The hospital is a small one. From the beginning of 1859 to the end of 1861 there were delivered only 317 women, and 321 children were born; yet of this small number 147 women suffered illness, and 21 died, or more than 6 per cent; and 20 children died.

It was observed, in reference to this frightful mortality, that, 1, reception of the pregnant women from one to eight days before labour increased the disposition to sickness; 2, more first than many-bearing women fell ill; 3, a very long stay was, almost without exception, followed by illness; 4, the greater operations mostly caused illness; 5, the majority of the sick children belonged to sick mothers.

The chief forms of disease were—peritonitis, endometritis, mastitis, fever without localization, septicæmia. There were 17 cases of this last-named form; all ended fatally. They were distinguished by rapid course, commencement with fever, pulse rising quickly to over 120, small, soft; skin at times hot and dry; at times moist. A shivering either ushered in the disease, or appeared later, or was repeated. Quickly, prostration of strength, apathy, sinking of the features followed; tympanitis, and effusion of fluid exudation in the peritoneum. Breathing became oppressed by the upward pressure of the diaphragm. Dyspnœa was often the first troublesome symptom. To this was often added cough, pleuritis, exudation, or pneumonia. Diarrhœa was rare; sometimes there was jaundice and inflammation of the joints. When this condition had lasted a shorter or longer time, the pulse rose to 140-160, became very feeble; the skin was covered with sticky perspiration, often sudamina; delirium and sopor preceded death. Death occurred from the second to the twentieth day.

The post-mortem appearances were invariably a very rapid decomposition, and cadaveric imbibition of tissues with blood; blood itself thin, containing few fibrinous coagula. When death did not come rapidly, there was found besides, the uterus but little involved, flaccid, so that impressions of the intestines were seen on its surface. Its inner surface was covered with a grumous, stinking matter. This removed, the underlying uterine substance was generally normal. The tubes were mostly wide, often filled with pus. The veins of the uterus were always normal. The lymphatics were often varicosely enlarged, filled with pus, which sometimes burst through the walls of the vessels, and caused abscesses. Sometimes greenish, gelatinous infiltration was found in the tissue of the uterus, or in the broad ligaments. The ovaries were generally swollen, and sometimes contained abscesses. Ovaries, uterus, and remaining pelvic organs were most frequently covered with flocculent exudations. In the abdominal cavity was fluid exudation, partly serous, partly albuminous, partly purulent. Frequently there was serum in the cavity of the chest, sometimes in the pericardium. The upper part of the lungs generally œdematous. Spleen enlarged.

5. Dr. Breslau relates the following case:—The head of a child whose extremities and trunk were born, stuck fast on account of enormous hydrocephalus. Delivery was effected by perforation, which let out an enormous quantity of water, and by the cephalotribe. The right lung contained air. Prof. Breslau asks whether the child did not breathe during the application of the instruments? On opening the abdomen the whole surface of the intestines was found covered with meconium, mixed with fibrinous exudation. The meconium had escaped from a small bright red opening in the intestine. The intestinal canal presented no obstruction in any part of its course.

The following memoirs are indicated by title only, space being deficient for their analysis :—

On a marked Case of Chronic Osteomalacia, with a description of the unusually Dilatable Pelvis. By Dr. Winckel. (Monatsschr. f. Geburtsk., March, 1864.)

On Faradisation of the Uterus in the Treatment of Engorgements and Deviations of this Organ. By Dr. Tripier. (Annales de l'Electrothérapie, Janvier, 1864.)

On Obstetric Bibliography. By Dr. Davidson, of Breslau. (Monatsschr. f. Geburtsk., May, 1864.)

On Spontaneous Evolution. By Dr. Haussmann. (Ibid.)

Two new Cases of Ovariotomy and Extirpation of an Uterine-Fibroïd with both Ovaries. By Dr. Köberle. (Ibid.)

Case of Large Polypoïd Growth of the Uterus in a Young Girl. By S. L. Hardy, M.D. (Dublin Quarterly Journal of Medicine, May, 1864. In this case the tumour filled the vagina; it was driven out of the pelvis, and caused death by hæmorrhage.)

Further Observations on Missed Labour. By Dr. McClintock. (Ibid. Dr. McClintock adds further cases to those recorded in his former memoirs in the February Number of the same Journal.)

On Uterine Epistaxis at the Commencement of Febrile and Inflammatory Diseases. By Dr. Ad. Gubler. (Gaz. de Paris, 1863.)

On Intra and Extra-peritoneal Exudations in the neighbourhood of the Uterus. By Dr. Nonat. (Paris, 1862. Moquet.) By Dr. Rollett. (Spit. Zeitung, 47, 48, 1863.) By Dr. König. (Arch. d. Heilk. iii. 1862.)

CONTRIBUTIONS TO MEDICAL LITERARY HISTORY.

Professor Corradi's 'Il Museo Medico.'

In our last number we expressed our belief that a convenient receptacle for contributions to medical *literature*, as distinguished from medical *science*, was a desideratum among the existing European journals. We have since received a strong confirmation of this opinion in the shape of a prospectus issued by Professor Corradi, of the University of Palermo, who proposes to establish a journal entitled, 'Il Museo Medico Giornale, per servire allo Studio ed ai Progressi della Patologia Storica, della Geografia Medica, della Storia e Letteratura della Medicina.' After some introductory remarks explanatory of the objects of the new journal (briefly expressed in the title, which we have given at length), the editor says that he thinks it will appear at an opportune time, inasmuch as it answers to a want felt by science; he adds, that he should not have attempted such an undertaking but for the encouragement given him by persons of authority, "especially in Germany, where such studies are cultivated with much zeal, and where formerly the illustrious Henschel did in the 'Janus' that which is now the object of the 'Museo Medico.'" The editor asks for the assistance of his medical brethren throughout Europe, and especially hopes to receive a friendly welcome from his "giornali confratelli;" and this accordingly we beg to offer him, while at the same time we assure him that it will give us much pleasure to find our opinion as to "the impossibility of carrying on a journal devoted *solely* to medical literature," proved by his example to be unfounded. We have only to add, that, if a sufficient number of subscribers is obtained, the 'Museo Medico' will appear in July, and continue to be published every other month; each number is to contain eighty pages, and to be sent to the subscribers post paid. The subscription for the year to persons living beyond the kingdom of Italy is ten francs and a half.

EPIDEMIOLOGICAL SOCIETY.

REPORT OF THE SMALL-POX AND VACCINATION COMMITTEE.

We would draw special attention of the public and of the profession to the above-named report, which was presented to the Council of the Society and adopted in April last. Referring to the dependence of life and health upon the adoption of right measures in this matter,[1] the Committee state most important reasons why the Council should press upon her Majesty's Government the great necessity of amending the vaccination laws; in this agreeing with the Medical Officer of the Privy Council, whose opinion as to the unsatisfactory condition of these laws was freely expressed in his last report, and also with the Lord President of the Council, who in the House of Lords, at the close of the last Parliamentary session, alluded to the inadequacy of the law. We must postpone any particular examination of this report for the present, only pointing out that it is recommended that greater powers should be given to local authorities in obtaining information as to the vaccination of children born, in taking proceedings against negligent parents, in supervising the performance of vaccination, and employing and remunerating fit persons to make local inquiries as to its observance. The Committee conclude that the control of public vaccination ought not to be vested in two distinct Government Boards, but that the powers now exercised by the Poor Law Board should be transferred to the Privy Council.

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On the present System of Medical Education in England. By G. W. Callender, Assistant-Surgeon to St. Bartholomew's Hospital. London, Spottiswoode and Co. 1864. (Pamphlet.)

The Seven Sources of Health; a Manual, &c. By W. Strange, M.D. Renshaw, London. 1864. pp. 312.

Researches upon the Anatomy and Physiology of Respiration in the Chelonia. By S. Weir Mitchell, M.D., and G. R. Morehouse, M.D. Washington City, New York. (Smithsonian Contributions to Knowledge.)

The Elementary Text-Book of the Microscope; including a Description of the Methods of preparing and mounting Objects, &c. By J. W. Griffiths, M.D., F.R.S., &c. London, J. Van Voorst. 1864. pp. 192.

The Prescribers' Companion. By A. Meadows, M.D., M.R.C.P., &c. London, Renshaw. 1864. pp. 152.

On the Phenomena of Hybridity in the Genus Homo. By Dr. P. Broca, Sécrétaire Général à la Société d'Anthropologie de Paris. Edited by C. C. Blake, F.R.S., &c. Published for the Anthropological Society. Longman and Co. 1864. pp. 119.

Medical Diagnosis, with special Reference to Practical Medicine; a Guide to the Knowledge and Discrimination of Diseases. By J. M. Da Costa, M.D., Lecturer on Clinical Medicine, &c., Philadelphia Hospital, Philadelphia. Lippincott and Co. 1864. pp. 690.

Advice to a Wife on the Management of her own Health, &c. By P. H. Chavasse, M.R.C.S. Sixth edition. 1864. Churchill and Sons. pp. 204.

Valedictory Address to the Graduating Class of the Female Medical College of Pennsylvania at the Twelfth Annual Commencement, March 16, 1864. By Ann Preston, M.D., Professor of Physiology and Hygiene. (Pamphlet.)

Notes on Clinical Medicine. By W. F. Wade, Senior Physician to the Queen's Hospital at Birmingham. No. III. Rheumatic Fever. (Pamphlet.)

Clinical Observations on Functional Nervous Disorder. By C. Handfield Jones, M.B. Cantab. M.C.S., Physician to St. Mary's Hospital. London, Churchill and Sons. 1864. pp. 585.

Etude Clinique sur divers Symptomes Spinaux observés dans la Fièvre Typhoïde. Par le Dr. E. Fritz. Paris, Delahaye. 1864. pp. 186.

A Woman's Example and a Nation's Work; a Tribute to Florence Nightingale. London, Ridgway. 1864. pp. 92.

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[1] No less than 3240 persons die (on the average) yearly in England from small-pox, and in London alone above 400. In the epidemic of last year, nearly 2500 persons died of the disease in London.

The Pathology and Treatment of Venereal Diseases; including the results of recent investigations upon the subject. By F. J. Bumstead, M.D., &c., New York. New and revised edition. Philadelphia, Blanchard and Lea. 1864. pp. 640.

The Principles and Practice of Obstetrics Illustrated. By H. L. Hodge, M.D., Emeritus Professor of Obstetrics, &c., in the University of Pennsylvania. Philadelphia, Blanchard and Lea. 1864. pp. 550.

Lectures on the Elements of Comparative Anatomy. By T. H. Huxley, F.R.S. —On the Classification of Animals, and on the Vertebrate Skull. London, Churchill and Sons. 1864. pp. 303.

Os Inoculações Syphiliticas e Vaccino-Syphiliticas, sua Prevenção, Diagnostico e Tratamento. Pelo Sr. H. Lee. Traduzido da Segunda Edição com licensa do auctor pelo Dr. J. A. Marques. Lisboa. 1863.

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On Diseases of the Throat and Windpipe, as reflected by the Laryngoscope; a complete manual upon their Diagnosis and Treatment. By G. D. Gibb, M.D., &c. Second Edition. London, Churchill and Sons. 1864. pp. 481.

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On the Mortality of Stoke-upon-Trent, and its Causes, with special Reference to Children and Potters. By J. T. Arlidge, A.M. and M.B. London, Senior Physician to North Staffordshire Infirmary. (Pamphlet.) 1864.

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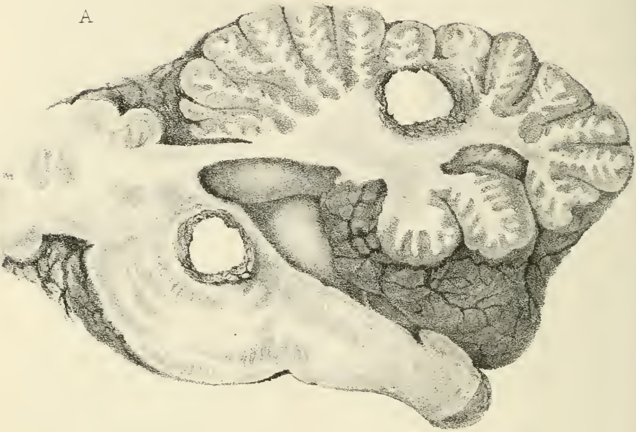

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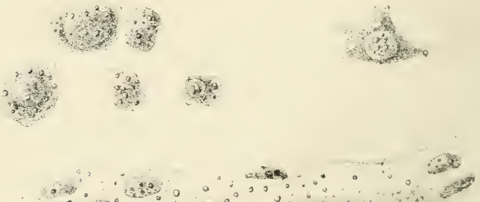

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Fig. 1.

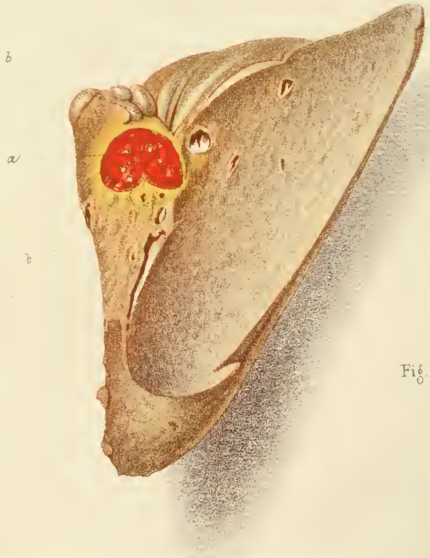

Fig. II.

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THE

BRITISH AND FOREIGN

MEDICO-CHIRURGICAL REVIEW.

OCTOBER, 1864.

PART FIRST.

Analytical and Critical Reviews.

Review I.

1. *Clinical Observations on Functional Nervous Disorders.* By C. Handfield Jones, M.B., &c.—*London*, 1864. pp. 585.

2. *Practical and Pathological Researches on the Various Forms of Paralysis.* By Edward Meryon, M.D., &c.—*London*, 1864. pp. 215.

The physiological and pathological researches of Van der Kolk, Brown-Séquard, Claude Bernard, and Lockhart Clarke, and the minute histological investigations of Beale, relative to the nervous centres and the nerves, are rich in materials for the use of the practical physician. The two works now before us are instances of the application of the results and hypotheses arrived at by those and other neurologists in the interpretation of the principal lesions of the nervous system, and afford gratifying evidence of progress made in the diagnosis, prognosis, and rational treatment of such lesions.

Dr. Handfield Jones restricts his observations to such nervous disorders as are called functional, omitting the results of manifest organic lesion. It seems to him "a vain dispute, whether in strict accuracy there are or are not any such disorders. The probability is that there are not—that in all morbid action the cells and fibres of the organs undergo some molecular change from their perfectly normal condition. It is, however, perfectly certain that there are very grave disorders in which the most careful scrutiny fails to detect any actual change, in which complete recovery is perfectly possible, and in which the 'juvantia' are such as operate more in modifying the power of the organs than their texture."

These opinions generally most physicians will be ready to endorse. There are undoubted functional derangements of organs whose histology is much better understood and more readily demonstrated, whether in health or disease, than the cerebro-spinal system. There are abnormal states of circulation, and therewith, as concomitant conditions, alterations of innervation without any structural changes of organs. And, in the case of the nervous system, such functional variations are even more conceivable than in other viscera, whether regard be had to its structural peculiarities or to the results of function—the nerve-force generated. The tendency of modern research is to assimilate nervous action to electricity, and the movement in this direction will derive increased impetus in the minds of perhaps many from the observations of Dr. Beale[1] of the non-existence of the presumed a-polar and uni-polar nerve-cells, and of the constant presence of two fibres to each nerve-cell to form a complete circuit. Assuming, therefore, the homology of the nervous with the electric force, we may, *à priori*, argue in favour of the occurrence of disturbances and variations in that force—i.e., of the existence of nervous disorder, arising from inaction and over-exertion, and particularly from alterations in the velocity, pressure, quantity, and quality of the blood supplied to the nerve elements. In derangements of the sort in question, "the most careful scrutiny fails (and we believe must ever fail) to detect any actual change" —at least, until the disturbed balance of forces has eventuated in alterations of the mechanism involved. After what lapse of time disordered action will induce organic change, is not determinable, but experience indicates that it may go on for a lengthened period, and yet ultimately yield to such "juvantia as operate more in modifying the power of the organs than their texture." Thus, for example, mental disorder may exist for months, or even for years, and suddenly vanish under the influence of strong emotion or of coincident bodily disease; or otherwise may, as an intermittent malady, decline and disappear repeatedly, to be as often renewed.

Nevertheless, though compelled to admit the occurrence of functional disorder without organic alterations of nerve-tissue, it would imply an indifference to truth to assume in any given case the absence of such changes. The improved methods of research by chemistry and the microscope now applied to the examination of nerve-substance, show clearly enough that serious lesion may subsist which the unaided eye, and even at times also the microscope, without the assistance of chemical reagents, fail to detect. The careful observations of diseases of the spinal cord made by Mr. Lockhart Clarke may be cited in illustration of this fact, and we are disappointed that those observations, and the lessons deducible from them, are not made use of by Dr. Meryon in his history of spinal paralysis. Without micro-chemical investigation of the nerve-tissue, it is impossible to pronounce with certainty on the absence of organic lesion in many cases of nervous disorder, where no morbid changes reveal themselves to unassisted vision.

The difficulty of determining the presence or absence of actual lesion of the nerve-tissue, so great even after death, and when that tissue can

[1] Philosophical Transactions, 1863, p. 543–571. We refer the reader to a fuller notice of Dr. Beale's paper, at a subsequent part of this number.

be subjected to minute scrutiny, must be still greater during life, owing to the frequent obscurity of diagnosis, the prevalence of similar symptoms under varied morbid states, the want of an intimate knowledge of the function of various parts, and the untangible character of nervous products. Dr. Jones's task, therefore, of separately treating of nervous disorders subsisting without organic lesion, is one beset with difficulty, and its performance must partake of imperfection in proportion as the diagnosis of his illustrative cases fails to discover their actual pathological condition. To aid in the discrimination of simple disturbance of function from the consequences of positive alteration in structure, he refers especially to the effects of remedies employed, or, in his own words, to "juvantia," which "operate more in modifying the power of the organs than their texture," such as galvanism, strychnia, and, in general, "nerve-tonics." Between a case of functional paralysis and one of paralysis from organic lesion there is, Dr. Jones argues, a wide interval. Strychnia and galvanism, which will probably benefit the former malady, will in all probability make the latter worse; certainly will not cure it. Yet while contending for this wide interval in the typical cases assumed in illustration of his subject, he is prepared to admit that "numerous instances of more or less mixed character intervene. Inflammatory disease is, from one point of view, organic; from another functional. It commences essentially as the latter; it ends as the former." This is much the same thing as saying that the distinction between functional and organic nervous maladies is of a shadowy character, and has no definite existence in nature, cognisable by human observation. Notwithstanding, however, this inability of distinguishing with precision the one condition from the other, practice presents to us numerous nervous disorders amenable to treatment deserving the most attentive study. It is such disorders that Dr. H. Jones makes the subject of his treatise; and he finds no lack of matter, as nearly 600 printed pages testify. Indeed, some of the maladies—as, for instance, epilepsy—furnish of themselves, as the 'Publishers' Circular' demonstrates, ample material for learned and long dissertations, and, in a general work of the sort under notice, claim, by their importance, space which we should have preferred to see occupied with a more copious history of nervous disorders less written about specially.

The disorders considered by Dr. Jones are viewed, as the title of the work intimates, from a clinical point of view, and therefore are well exemplified by cases occurring in the author's own practice, or placed on record by other physicians. The arrangement adopted "is merely topographical . . . . commencing with the encephalon, including the cerebral hemispheres, mesocephale, cerebellum, and medulla oblongata, we shall proceed to the spinal cord, and thence to the several nerves or nervous districts, which are found by experience to be most prone to disorder." (p. 4.) Such a topographical arrangement may be practically convenient, but has no other claim to attention, for many of the morbid conditions discussed as local affections, such as cerebral excitement, headache, vertigo, chorea, &c. &c., are often or mostly the consequences of general bodily illness. We are, indeed, convinced that Dr. Jones himself assigns no importance to the arrangement, but has used it simply from the inability of medical science to supply the basis of a classification founded on the exact lesions of the nervous system, of which the maladies recognised provisionally as morbid entities, are nothing more than the outward manifestations.

After an introductory chapter, the author devotes a second to the general pathology of the nervous system, in which he particularly elucidates the nature of "inhibitory" nerve-phenomena, and submits to criticism some parts of the hypothesis of reflex paralysis, as advocated by Dr. Brown-Séquard. He coincides generally with Lister in asserting that inhibitory action is not restricted, as Pflüger taught, to a certain set or system of nerve-fibres, but "that one and the same afferent nerve may, according as it is operating mildly or energetically, either exalt or depress the functions of the nervous centre on which it acts." This doctrine, however, Dr. Jones would modify, "so far as to believe that it is not the energetic operation of an afferent nerve that causes inhibitory action, but its being injuriously affected by some impression made upon it. The enfeebled state of the nerve itself, or of the centre to which it proceeds, or the severity or malignity of the impression, may give rise to the familiar effect." (p. 10.)

This so-called inhibitory influence plays an important part in physiological and pathological phenomena, and as an hypothesis elucidates numerous anomalous cases of disease. What is meant by it will best appear from some examples adduced by Dr. Jones:—

"O. J., aged thirty-seven, got a whitlow on the last phalanx of the left thumb. The lymphatics were inflamed, and the axillary glands swollen; the whole arm was very painful. While the limb was in this state, one morning he found that he saw double, and had a squint in the left eye. At the Ophthalmic Hospital it was found that the external rectus muscle was completely paralysed, and he had circumorbital pain. It was supposed that there was periosteal inflammation about the orbit, and iodide of potassium was given, the whitlow was poulticed, and the arm fomented. After a month of this treatment there was no improvement of the eye, but the arm inflammation had quite subsided. A piece of dead bone was now removed from the seat of the whitlow; soon after which the squint disappeared, as well as the pain in the arm, and about the orbit. The external rectus had quite recovered its power. In this instance pain in sensory nerves about the orbit and paralysis of a single motor nerve were co-results of the morbid impression conveyed from the diseased finger to the centre. Dr. Watson refers to the production of amaurosis without visible change in the eye, in consequence apparently of irritation of the dental nerves, the blindness ceasing after the extraction of some teeth which had grown irregularly. He quotes from Mr. Lawrence an interesting case, in which the extraction of a carious tooth, with a splinter of wood projecting from one of its fangs, procured the restoration of the sight of the eye of the same side, which had been entirely lost for thirteen months. In such cases the paralysis of the retina or of the optic tubercles may fairly be designated inhibitory. . . . Some while ago I had a gentleman under my care with acute rosacea of the face and head, and chronic corneitis, with vascular development on the cornea. I applied on one occasion some liq. plumbi diacet., diluted with an equal amount of water, to the upper lids (everted), which I found very red. This caused excessive irritation; the eyes became greatly congested, watered extremely, and were very painful; while the skin of the face, the nose especially, became of a deep red, and all the vessels of the face much congested. There was extreme photophobia. It was half an hour before the hyperæmia began to subside. The irritation in this case evidently was reflected from the branches of the first division of the fifth nerve supplying the lids, on to the vaso-motor nerves of the arteries supplying the skin of the face, which, in consequence of the *morbid* impression became *dilated*—not contracted, as they normally should according to the law of reflex action. This was a marked example of inhibitory action. . . . The pathology of these cases is no doubt the same; a nerve of special sense, a musculo-motor or a vaso-motor being paralysed according to the direction which the irritation happens to take." (p. 13.)

The result of the nervous stimulus—i.e., whether paralysing or exciting — also depends very much on the condition of the nervous centre which is affected.

We have quoted at length these illustrations of what is meant by inhibitory influence, inasmuch as it is a recent hypothesis, and in the main agrees with what has been taught under the term reflex paralysis. The latter mode of explanation involved the admission that the paralysis was due to anæmia of the nervous centre from which the affected nerves started, "produced by the reflection of the original irritation on the vasa-motor nerves supplying the arteries."

To this mode of interpretation Dr. Handfield Jones objects that:

"(1st.) It is difficult to suppose that a spasm of reflex origin should be limited to such a very small extent of vessels as would be involved in some instances—e.g., palsy of one of the sixth nerves, ptosis of one eye. (2nd.) It is almost impossible to believe that a contraction of vessels should be so persistent as the hypothesis requires. Can we suppose, in the case of amaurosis above cited, that the arteria centralis retinæ was spasmodically occluded for thirteen months? (3rd.) It has been found by Gull that irritation of the renal nerves does not cause contraction of the vessels of the spinal cord, nor paralysis of the lower limbs, as Brown-Séquard stated in explanation of the paraplegia from renal disease. (4th.) In some cases of paralysis from exposure to wet and cold, the paralysis continues long after the exciting cause has ceased, and is removed by stimuli applied to the sensory cutaneous surface. Here the paralysis must be non-organic; and yet it can scarcely be supposed to depend on anæmia of the centres resulting from arterial spasm. On the other hand, it is intelligible that the nerve-cells might be thrown into a state of enfeebled action by the cold, &c., from which they could not easily recover. These cases, though not typically inhibitory, seem to me very illustrative of the nature of the morbid action." (p. 14.)

There is a certain weight in these objections generally to Dr. Brown-Séquard's hypothesis. The fourth one nevertheless has, *per se*, little importance; for if spasm of the arteries of a nerve-centre can produce anæmia and consequent paralysis of its efferent nerves, it does not necessarily follow that the paralysis should disappear forthwith when the arterial spasm is removed and the healthy nutrition of the centre restored, for this reason, that the prolonged anæmia will in all probability have induced an altered state of the nerve tissue incompatible with normal function, which may persist for some length of time. If this be so, then the only distinction Dr. Jones can discover between inhibitory and reflex paralysis—viz., that in the former the "paretic" state may sometimes "persist for an indefinite time after the cessation of the cause which has morbidly affected it," whilst in the latter it increases or diminishes with the irritation and ceases with it—becomes, as it appears to us, futile. (p. 13.)

Further on, at page 139, Dr. Jones reopens the question, and states that reflex paralysis is a rare affection, and that he has never met with an instance. He would restrict the term to

"Cases where the paralysis is evidently dependent on a persistent irritation, increasing when this is increased, and *vice versâ.* It is characteristic of *true reflex* paralysis, that removal of the irritation proves curative, while all other means fail. It is certain that no true case of reflex paralysis would be benefited by strychnia or galvanic excitation of the nerves or muscles of the affected part, nor by stimulating applications to the cutaneous surface. These are appropriate to the paretic state, and form by their success a good test of its presence."

Without discussing the correctness of the latter assertion respecting the inutility of remedial agents such as those mentioned in cases of reflex paralysis, we will only remark that the assigned characteristic of true reflex paralysis applies with equal force to the cases Dr. Jones has adduced as examples of inhibitory paralysis; as, for instance, that of paralysis of the external rectus from whitlow of the thumb, and that of amaurosis from dental irritation. So far, therefore, as the author's arguments and illustrations are concerned, we find no sufficient basis of distinction between inhibitory and reflex paralysis; and we prefer, on the whole, to retain the latter term to express the symptomatic condition, whether due to anæmia of the nerve centre, as supposed by Brown-Séquard, or to a "paretic" (enfeebled) state of its nerve-cells, as Dr. Jones imagines, produced by irritation of an incident nerve. What difference subsists is only between the hypotheses propounded in explanation of the resultant phenomenon—the paralysis—and it remains to be proved whether this may not at one time be due to anæmia from vascular constriction, and at another to a paretic state of the nerve-cells of the irritated centre. In either case the term reflex paralysis appears applicable.

The author shows a predilection which we do not equally share, for foreign words and expressions, most, if not all of which, supplant genuine English ones, or could be replaced by English derivatives. The advance of science no doubt necessitates new terms, whilst the character of our language renders compound words less possible than does the German; we are, therefore, compelled to coin many words from the Greek and Latin tongues, and usage familiarizes us with many other such for which the plea of necessity cannot be urged. Consequently, a critic may be indulgent when these classic derivatives are not too thickly strewn in the pages under notice; but it behoves him to dissuade from the excessive use of such, as in the work now before us.

The author employs the word paresis and the adjective paretic largely throughout his work. It is a pure Greek word, signifying relaxation or weakness, and, so far as we are aware, was first used in modern times by Dr. Ernst Salomon, a Swedish physician, to designate the peculiar form of paralysis among the insane, mostly known as "general paralysis," but in which actual motor paralysis, particularly in the earlier stages, is so slightly marked as to be overlooked by those little acquainted with the disease. In this general paresis of the insane the mental symptoms are more marked than the paralysis of motion and sensation, the paralysis being, in matter of degree, incomplete or imperfect, an apparent state of weakened nervous power. In commencing his chapter on "Cerebral Paresis," Dr. Handfield Jones adopts the word pretty much in this signification, remarking: "By this term I mean a state in which, without demonstrable organic change, there is greater or less enfeeblement of the functional power of the brain." But paresis, as a term, is not limited to conditions in which organic change is absent; for in the general paresis of the insane such change is often very pronounced in the nervous centres; and in various parts of his book the author has used it, when speaking of paralysis due to organic lesion. Indeed, he has loosely applied the word, substituting it, we think, without good reason, for paralysis, and *vice versâ*. Even if rightly restricted in its use, it expresses nothing more, except in the case of general paresis of the insane, than cerebral or nervous exhaustion or debility.

The subjects treated by Dr. Handfield Jones in the work before us are necessarily very numerous, for functional nervous disorder may have its seat in any organ or part of the body. Hence we find chapters on cerebral and spinal hyperæmia and anæmia, on cerebral and spinal paresis, on cerebral excitement and delirium tremens, on tetanus, catalepsy, and epilepsy, on spasmodic and neuralgic affections and neuroses of numerous parts, on hysteria and malarioïd disorder, &c. The chapter on the last-named subject will be read with much interest and instruction. There is an almost endless variety of disorders generated by malaria through the medium of the nervous system. In connexion with these, the author passes under review many "of the forms in which malarious disease appears in this country . . . . . . maladies which are scarcely recognised in ordinary text-books."

The last chapter of the book is occupied with a discussion of the therapeutical properties of those drugs which are employed in nervous disorders. It is one of value to the practitioner on account of the amount of information brought together in its pages. The final essay of the author bears the quaint title of the "Vindemiatio," the harvest or vintage, implying the summary, or the essence of his teachings.

The scope of Dr. Meryon's work is much more limited. He professes to deal only with the various forms of paralysis, and accordingly proceeds, after a good introductory sketch of the anatomy and physiology of the nerve-centres and nerves, to pass under review the several lesions of the spinal cord and brain generally recognised as causes of paralysis. The two chapters on these lesions are followed by others on "Paralysis from Blood-poisoning," "Paralysis from Reflex Action," and on "Progressive Forms of Paralysis." But though the author has produced a readable and instructive book, it has not quite the qualities we look for in a special treatise. Its matter might, in our judgment, be better arranged, and the history of most of the lesions considered might be more complete.

Paralysis from dislocation and fracture of the spinal column has a place, but the more common form consequent on caries receives no attention. Cerebral apoplexy and red and white softening are described, but abscess of the brain escapes discussion. Apoplexy constitutes an important chapter, but the account of it is wanting in precision and clearness. He comprises under the title cases in which there is cerebral hæmorrhage, and others in which there is only congestion. He narrates the case (Case 31) of an American gentleman, F. B., aged sixty-seven, who got an apoplectic attack, with sudden head-ache, vomiting, and loss of consciousness for a time, after having previously suffered "much bodily fatigue and very great anxiety concerning his country." The attack was followed by slight drawing of the mouth to the left side, drooping of the right eyelid, deafness of the right ear, disabled lips, a constant dribbling of saliva, considerable difficulty in swallowing, and distressing paroxysms of dyspnœa on falling asleep. We will quote most of the author's comments on this case, premising that we cannot see in it, as he does, an example of reflex paralysis, and that, as far as we can apprehend, his meaning is obscurely expressed:

"As an instance of diffused influence of emotional impression, this case would perhaps be more correctly placed under the head of reflex paralysis; for this latter may have had a centric origin and been attributable to a source within the cerebrum, just as the opposite phenomenon of excited muscular action of automatic form and cerebral origin is often induced by insanity, but inasmuch as the paralysis resulted from effusion or mechanical pressure, probably in the medulla oblongata near to the nucleus of the facial nerve, I have referred to it here.

"The case is furthermore interesting as touching a remark by Dr. Laycock in a paper 'On the Reflex Function of the Brain,' . . . . that emotions of the mind act principally on the excito-motory system by relaxing the sphincters, and inducing vomiting, micturition, and defæcation. In my patient, however, I am disposed to think that the nucleus of the pneumogastric nerve was affected; and it is a matter of some importance, seeing that emetics are sometimes given with a view to relieve a disordered condition of stomach. Three emetics were, in fact, given to F. B., but without arresting the disposition to sickness."

The following case, quoted from Trousseau, of a youth, aged seventeen, who got facial paralysis after lying asleep, on a cold day, upon a heap of stones, having been previously in a state of perspiration, is instructive in itself, but we do not understand why it should be inserted in a chapter on apoplexy. It may be urged that it is given in order to illustrate the diagnosis between such a form of idiopathic paralysis and paralysis from cerebral lesion; but if so, this purpose is very indifferently fulfilled by it; for after the description of the symptoms of the case is concluded, Dr. Meryon subjoins these remarks: "These cases of idiopathic facial paralysis generally terminate favourably, and the more rapidly they come on, the quicker do they get well;" and then proceeds thus:

"The power over the orbicularis palpebrarum, therefore, is the only perceptible difference; and Dr. Cazalis, of the Salpêtrière, has described the imperfectly palsied lid as a diagnostic sign of facial paralysis dependent on intra-cranial hæmorrhage, and the perfectly-fixed lid as indicative of affections of the nerve only."

In the chapters on red and white softening, the details of diagnosis might be more complete and better arranged. In the middle of his dissertation on red softening, he enters (p. 114) into a discussion whether softening of the cerebral commissures between the two cerebral hemispheres may not be a cause of intellectual disorder, and treats the question without regard to the nature of the softening.

The minute pathology of red softening is all comprised in the following sentences:

"The pathological change which is known as red softening is essentially a capillary hæmorrhage into the surrounding substance of the brain, and the only difference between it and the blood-clot in apoplexy is that the extravasated blood is infiltrated into the cerebral substance, with which it is intermixed in the one case, whilst it forms to itself a cavity, and exists as a mass or clot in the other."

There is no attempt here or elsewhere to discriminate the varieties of cerebral softening in their minute and intrinsic details; indeed, all the varieties are not even enumerated. The description of red softening above quoted applies rather to the consequences of cerebral contusion, and fails to convey an accurate notion of the results of cerebritis or inflammatory softening. The fallacious notion that red softening consists only of extravasated blood is again repeated (p. 117), where its treatment is discussed, and it is stated that "the principal indication is to reduce the violence of arterial action, and thereby to prevent the further escape of blood."

The section on Induration of the Brain contains no notice of the researches of Virchow, Albers, and others, relative to the mode and kind of deposit of abnormal histological elements within the cerebral tissue, or, to borrow their term, the parenchymatous infarction of the brain. The whole morbid anatomy of induration presented to us is comprehended in the following quotation, the clearness of which is unfortunately beclouded by the sentence marked by ourselves in italics:

"This form of induration (no form, by the way, has been previously mentioned [REV.]) is generally the result of chronic inflammation; but *an opposite condition of the intra-cranial substance* is recognised by pathologists as resulting from great and exhausting exudations in other parts of the body—such, for example, as frequently occurs in the course of typhoïd fever, or after scarlatina, when the brain-substance, like other tissues, may be drained of its fluid element, and become hard and tough." (p. 125.)

In conclusion, we would remark that, in the remaining sections of the book, observations occur deserving consideration; and the illustrative cases, derived from the author's own experience or from the writings of others, will always possess value to the student; but we cannot conscientiously say that the work satisfactorily represents the present state of pathological knowledge respecting the several forms of paralysis.

The treatise of Dr. Handfield Jones will no doubt find its way into the libraries of medical men by reason of the true practical character of its contents, and the importance and the frequently perplexing nature of the disorders of which it treats. The chapter on the general pathology of nervous diseases is worthy of attentive study, and need be well digested before the subsequent portions of the work are read. The several morbid conditions discussed are pourtrayed by the record of cases, the symptoms, course, and treatment of which are fully detailed and largely commented upon.

Review II.

Hill Stations in India. (Report on the Sanitary State of the Army in India.)

In our notice of the Indian Sanitary Report in the January number of the Review, want of space prevented us from dealing with the important topic of hill stations as one of the several elements, and not the least efficient one, in maintaining the health of our troops in India, and indeed in all tropical climates. The elevation of a hundred feet or two above the level of the shore, or of river courses and flat plains inland, will often make all the difference in the world in respect of healthiness or sickliness of site, and especially during epidemic seasons. When the plague was sweeping off its thousands in Cairo, the citadel, but a short way out of town, used to be exempt, although communication between the two was scarcely, if at all, interrupted. In the worst yellow fever years at Sierra Leone, the barracks on the top of the hill overlooking Freetown have generally proved a place of safety; and here too, in London, we have seen how comparatively innocuous has been the poison of the cholera in the dry and breezy heights of Hampstead and Highgate. Even in the case of some endemic chronic maladies, a like difference in point of their frequency and severity is to be observed; as, for example, with the goitre and cretinism of the Swiss and other valleys. Nor can we be surprised at this marked influence of site on the production and character of disease, for it is an observation as old as the days of Hippocrates, that a pure and a dry air, and plenty of it, are favourable to health and life; and that the opposite conditions of humidity and stagnancy, or unrenewal, are adverse, while they greatly foster the development and promote the activity of all noxious emanations from the ground. But it must be confessed that as yet but little progress has been made by medical men in investigating, with the care and accuracy it requires, the important subject of the topographical relations of disease, and consequently in determining many questions of the highest moment affecting the health and welfare of communities and peoples.

Dr. Balfour remarks, in a paper quoted in the 'Indian Sanitary

Report,' that "if the whole or greater part of the army in India could be retained at stations where the mortality is the same as at Bangalore, Poonah, or Meerut, a reduction would be effected in the deaths equal to half the present amount." At Bangalore, the death-rate of recent years appears to have been somewhat under 20 per 1000, at Poonah about 16 per 1000, and at Meerut about 20 per 1000 (among the cavalry).[1] The two first are genuine hill-stations, the one in the Madras and the other in the Bombay presidency; the former is 3000 and the other 1800 feet above sea level, and both on elevated hilly plateaus. Meerut, to the north of Delhi, is very differently situated; it is not more than a hundred feet above the adjacent country, and its elevation of 900 feet above the sea is due only to its being so far inland, along the upward course of the mighty Jumna and Ganges rivers. It is therefore a station on the plains; and yet, at least in some years, and for some arms of the service, it has proved anything but unhealthy, even as compared with many hill-stations. The Appendix to the 'Report' abounds with evidence to show that mere elevation will never, by itself, suffice to secure the maintenance of health or the prevention of excessive sickness. Secunderabad, where the barracks have been abandoned in consequence of the enormous mortality year after year among the troops, is at the same elevation as Poonah, and is by nature far from being an insalubrious position. Bellary in the same presidency, Madras, notorious too in the annals of Indian military mortality, is 1600 feet above sea level; while Cannanore, one of the healthiest stations in that presidency, is on the coast, and not above twenty feet above its level. Vellore, at an elevation of 700, once a healthy station, became the reverse by mismanagement and neglect. Two of the healthiest stations in the Bengal presidency seem to be Sealkote and Rawul Pindi, in the Punjaub; neither of them hill-stations. The former is on a flat plain, dry, and without wood, jungle, or water in the vicinity, rising towards the hills on the north and falling towards the south. It is open, and freely exposed to the winds. The station has been singularly exempt from epidemic visitations since its establishment in 1849. "In the selection of this station, one fact was most particularly noticed—viz., the number of children and their freedom from diseases of the spleen, showing an immunity from fever." The stations of Umballa, Lahore, Mean-Meer, and Peshawur, all of them at greater above-sea elevations than Sealkote, have been far more unhealthy. Rawul Pindi, higher up the country in a north-west direction from Sealkote, and consequently considerably more elevated above the sea, is only a few feet above the level of the surrounding country:

"The cantonment is bounded on the north by a fine alluvial plain, running to the foot of a range of mountains fifteen miles distant; on the east by low hills and undulating ground; and on the south and west by arable land, occasionally broken by ravines. The barracks, &c., are generally placed on the watershed of a high slip of ground, and are well drained to the south into a

[1] The mortality of the large force (1777) at Meerut in 1860 was only 11 per 1000 of the strength.

ravine, and to the north into a nullah. There is not much wood, jungle, or water in the vicinity."

As to the influence on the health of troops of high mountain elevations in India, as from 4000 to 7000 feet above sea-level, the information we possess seems to be anything but favourable. The information, indeed, is very imperfect in many respects, without due attention to all of which it is of course impossible to form any accurate conclusions. At Kussowlie, Subathoo, and Dugshai, in front of Simla, the death-rates are stated to have been in the ratio of 37, 36, and 68 per 1000.[1] Much of the mortality was due to alvine flux, apoplexy, and fever. At Murree, which is due north of Rawul Pindi, and seven thousand feet above sea-level, the mortality for five years was 92 in 1000; but then it was a depôt for invalids, and many, if not most of the deaths were among men who had been affected elsewhere. The same thing may, indeed, be said of all the Himalayan hill stations. One of the most frequent causes of death in such localities has been dysentery; and this is just what might have been anticipated by any one who has watched, upon himself, the effects of great and sudden alternations of temperature when there is any tendency to intestinal irritability, unless the utmost care be taken in regard of clothing, diet, and exposure.

"The majority of the stations being on the outer face of the mountain ranges, and at an elevation where the heaviest rains occur, receive the first impact of the monsoon; and the consequence is, that they are all wet and subject to cold fogs. The annual rainfall in the Himalaya stations varies from seventy to one hundred and thirty-two inches, as at Darjeeling. In the Neilgherry group, which are not exposed to the monsoon, the rainfall is from fifty to sixty inches a-year."

The Himalayan stations are described as having clouds continually hanging about them, dispersing and reforming very quickly; at one moment in sunshine with inconvenient warmth, and at another in cloud with considerable chill. The position, too, of many of these high hill stations in India is anything but good, and the sanitary condition of the barracks and their surroundings is often most faulty. At Mount Aboo, the barracks are said to stand in a malarious gully; and at Nynee Tall, seven thousand six hundred feet above the sea, the huts have been built in a narrow defile. At Darjeeling, in Sikkim, and the hill station nearest Calcutta, the sanitary condition of the convalescent hospital is declared to be bad. Similar reports are given of the hill stations in the other presidencies. At Jackatalla or Wellington, in the Madras Presidency, at an elevation of six thousand feet, the death-rate was 39 per 1000; one-half of the deaths were from bowel complaints. The barrack-square "was frequently an immense swamp," and accumulations of filth abounded in the neighbourhood. "One thing is quite clear," remark the Commissioners, "that it will never do to trust simply to elevation above the plains to keep the army in health." Most true; but why follow up the statement with the

[1] In 1860, the death-rate at Subathoo was only 15, and at Dugshai 28, per 1000.

doubtful declaration that "malaria has been blown up ravines in India far above the fever-range over sites otherwise healthy, and those who slept within its influence have been attacked with fever and died." The cause of the fatal fever was doubtless much nearer at hand than the alleged ravine, although it is quite true that deep damp gullies are notoriously unhealthy in all tropical climates.

As reference is continually being made to the cantonment of Newcastle in Jamaica, as affording the strongest proof of the immense advantages of elevated hill stations in tropical climates, it is necessary that the circumstances connected with the selection of this site, and the results which have hitherto been obtained, should be kept clearly before the mind. Up to 1836, or thereabouts, the death-rate among our troops in Jamaica had been usually enormous, as high as 110 or 120 per 1000 in the course of the twelve months. Nor was this wonderful when it is considered how soldiers were treated in those days; packed close together in ill-ventilated barracks, fed on salt meat, plied with bad rum, and exposed without any precautions to all the injurious influences of a hot climate, amid a notoriously dissolute community. The consequences were inevitable; the medical officers at the time knew what must follow, but their remonstrances were then utterly unheeded. Dr. Bone, one of the ablest and most active of the medical staff of those days, gave a formula for the inevitable production of fever, and high sickness and death-rates among the troops:

"Take," says he, "of soldiers lately arrived in the West Indies any number; place them in barracks in a low, wet situation, or in the mouth of a gully, or on the brink of a dry river, or on the summit of a mountain, and to leeward of a swamp or of uncleared ground, and where there is no water, or only bad water; give them each only twenty-two inches of wall in their barrack-room; let their barracks have neither galleries or jalousied windows, close window-shutters, and a hole or cellar under the flooring for containing mud and stagnant water; and the windows only eighteen inches from the floor, that they may be obliged to sleep in the draught of air; and let them have drill every morning on wet ground and when fasting; guard-mounting and all kinds of fatigue, not in the morning and evening, but during the hottest time of the day; when on sentry, no shed to keep off the direct rays of the sun; bad bread and meat, few vegetables, plenty of new rum, especially in the morning; discipline enforced by terror and punishment . . . . let these directions be attended to, and especially when the air is stagnant or charged with noxious vapours, and the soldiers will soon die off, and those first in the rooms where the directions have been most carefully observed."

To Lord Howick (the present Earl Grey) when Secretary for War, the credit is mainly due, we believe, for first taking measures to arrest this frightful waste of life; the accommodation of the men was improved, fresh meat four or five days a week was substituted for the everlasting salt beef or pork, and facilities for obtaining tea and coffee were provided. The mortality was reduced to one-half within a very short time; still it was high, ranging from 40 to 60 in the 1000. There was yet much in the sanitary and hygienic treatment of the men to be corrected; but the governing authorities, whether at home or in the colonies, did not then understand nor appreciate the full importance of the subject on health and life at all elevations, and in all latitudes without exception. It was with Lord Metcalfe when governor of Jamaica, and Sir W. Gomm, when commander of the forces in the island, that the idea of establishing a station high up on the range of the St. Andrew mountains, which form so magnificent a background on the north to Kingston, originated, and no time was lost in carrying it out. Most beneficial results had been obtained at the cantonment at Maroon Town, on the north side of the island, about two thousand feet above the sea level, where the mortality had usually been not more than half that at Montego Bay and Falmouth on the coast. The site selected for the new station was nearly twice as high, being three thousand eight hundred feet above the sea. There is a carriage-road from Kingston to about one thousand five hundred feet; the rest of the ascent is by a bridle-path, which is often very steep, and for the conveyance of stores it is by no means easy. For some years after the first occupation, there was a good deal of fever and dysentery among the troops; but as the bush all round the cantonment was cleared away, the frequency of these disorders abated, and the general health of the soldiers stationed there has been on the whole good, and the death-rate low. But, notwithstanding the salubriousness of the climate, Newcastle has not been exempt from epidemic visitations not only of the cholera (which in other parts of the world has reached far greater elevations), but also of yellow fever, from which it was at first imagined to be secure. That artificial sources of atmospheric impurity, springing up in consequence of sanitary neglect, had to do with the aggravation, if not the production, of both diseases, cannot well be doubted by any one who has read the account of the outbreak of yellow fever in the garrison by Deputy-Inspector Dr. Lawson, in this journal a few years back; affording thus another useful warning as to the necessity of an ever vigilant medical police, wherever numbers of men are brought together even in the most salubrious climate.

In the Army Report for 1859, we are told that—

"At Newcastle, paroxysmal fever can scarcely be said to prevail, and even continued fevers furnish only one-fourth of the proportion at Port Royal, while diarrhœa and sore throat may be said to be confined to Newcastle, and the cases of ophthalmia are three times as high there as at Port Royal."

And in the Report for 1860, that—

"The defective state of the latrines, the limited nature of the cooking arrangements, &c., were thought to counterbalance, to some extent, the advantages derived from the salubrious climate of the station."

In any attempt to estimate fairly the advantages of Newcastle, as compared with other stations in Jamaica, the comparison must of course be made during the same period of time, and with troops in all other respects similarly circumstanced. To contrast the low death-rate at Newcastle during the last twenty-five years with the enormous death-rate in the island generally at an earlier date, serves only to mislead and deceive. Now the fact is, that there has been much less sickness and mortality among the entire military force in Jamaica during the above period than there used to be, and the causes are very obvious. The amount of the force in the island has been very much less, the troops have been more dispersed, better accommodated, better fed, and some notoriously unhealthy barracks have been abandoned. It is a curious circumstance, and not without much significance, that Lord Metcalfe himself, to whom, as we have seen, the removal of the troops to a site nearly four thousand feet was mainly due, remarked, in reference to Jamaica, that "it offers almost every climate, and that of about twelve hundred feet above the sea level is a perfect one." And so, say from twelve hundred to eighteen hundred feet, will most people assert who know the island. Yet Stoney Hill barracks, which have been all but abandoned in consequence of their extreme unhealthiness, stand at the very elevation commended by his lordship. How much of this unhealthiness was due to natural causes, and how much to induced and adventitious causes, we need not now discuss; the example, like that of Secunderabad and other similarly situated stations in India, serves to show that mere altitude is but one element only to be taken into account in the selection of a military station. Even at much lower elevations than Stoney Hill, many of the stations in Jamaica might doubtless have been anything but insalubrious with due precautions. This is obviously the view taken by the author of the official report on the health of the island as to Up-Park Camp, only two or three miles to the north af Kingston, and not above two hundred feet or so above the sea-level, of which he says:

"A station which I cannot but think *ought* to have proved far more salubrious, even to white troops, than it has hitherto done. The situation is fine, well exposed to the sea breeze during the day, and refreshed by a cool land wind at night. It is well-known that the pens or private residences in the neighbourhood of the cantonment are, on the whole, considered healthy. The cause of the insalubrity must be sought for in artificial rather than in natural, in instrinsic rather than in external agencies—agencies resulting from the neglect and violation of simple sanitary laws, whose observance is especially necessary wherever human beings are congregated together in a limited space, as in barracks." (p. 123.)

From the consideration of all the evidence yet before us, whether in the East or the West Indies—and it is to be remembered that evidence is yet very incomplete—the reasonable conclusion seems to be, that heights of moderate elevation above the level of the surrounding country are to be preferred, on the score of health, for permanent military stations to those of great altitude. Sir Ranald Martin gives it as his opinion that, as respects India, the best elevations have yet to be determined, and that probably heights of from two thousand to four thousand feet, if otherwise suitable, would be best in practice. Dr. James Bird, whose attention has been much drawn to this subject, considers that, "on the whole, table-lands of two thousand feet, when favourably exposed to the influences of the sea breezes, and protected from dry land winds, are the most healthy;" and the experience of those who have examined the hill stations in Jamaica, and are acquainted with the geography of that island, seems to indicate that the site of Newcastle is at an unnecessarily great elevation, and that all, or nearly all, the benefits of a fine and healthful climate might have been obtained in a well-chosen spot at one-half the altitude, while the facilities of ready access and conveyance would have been very much greater.[1]

As to the suitableness of the mountain stations in India for *sanitaria*, to which sickly persons might be sent for the recovery of health, the results of experience are decidedly adverse. Men beginning to suffer, or whose constitutions have become lowered by the relaxing heat of the plains, will be benefited by the change, but not those who are already diseased. Removal to another climate will be far more speedily efficacious. The whole bearings of this branch of military hygiene—viz., of topographical medicine, have yet to be carefully worked out, and all that we have attempted or designed to do in this short article, is merely to direct the attention not of the medical men of the army only, but of the profession generally, and in a particular manner of our brethren in the colonies and distant possessions of the British Empire, to its great and varied importance.

Review III.

Urine, Urinary Deposits, and Calculi; and on the Treatment of Urinary Diseases. By Lionel S. Beale, M.B., F.R.S., Physician to King's College. Second Edition. 1864. pp. 439.

It is pleasant, in the present age of bookmaking, to meet from time to time with a work like the present one not "got up" for sale, with large print and a very wide margin, and not clothed in gorgeous cloth, with a startling title meandering in gilded letters on the outside; but a work quiet, unassuming, condensed, original, and fitted for the student, in the widest acceptation of the term.

The pathology of the urine has now become so important a branch of medical study, not merely as affording a means of detecting diseases of the urinary organs themselves, but also as furnishing a material aid in the diagnosis of various other diseases, that a more than superficial knowledge of the subject has become necessary for every practitioner; and the student of the present day cannot afford to be satisfied with learning that albumen is precipitated by heat and nitric acid, that the presence of *ropy mucus* in the urine is an indication of catarrh of the bladder, and that gravel and gout go together; but he must be able to perform quickly and correctly a number of chemical analyses, to distinguish the different urinary deposits under the microscope, while at the same time he cultivates, as carefully as did his fathers, that faculty on which alone they could rely for diagnosis—the faculty of

[1] See an interesting paper by Dr. Milroy, "On the Advantages of Mountain Sites for Barracks in Hot Climates," in the Lancet for July 9th, 1859.

exact clinical observation of symptoms. It is a fault of nearly all books on the urine, that they deal too exclusively with chemistry; that they are written too often by chemists, and not by men who are daily in the wards, and working at the microscope as well as in the laboratory. This it is which adds so materially to the value of the book in question, and makes it so essentially the student's handbook; for, while containing chemistry enough to satisfy the most advanced, it pays particular attention to the microscope, and is still further enriched, in this second edition, by some well-arranged clinical remarks. Though still dedicated to his former pupils, it is no longer published in the form of lectures, but in a series of chapters, the arrangement of which differs materially from that of the lectures in the first edition. The illustrations are collected together in plates, which are distributed throughout the book, and so arranged that each plate may, as far as possible, contain illustrations of the objects described on the pages in its immediate neighbourhood. This is certainly less convenient than the arrangement in the first edition, where the woodcut is on the page, at the very part where the object to be illustrated is described. The referring constantly to a plate which is sometimes ten or twelve pages removed from the object under consideration is very tiresome. Either let the plates be all grouped together at the end of the book, with a good index appended, or let the woodcut be introduced at the part where the object is described.

In the chapter *on the anatomy of the kidney*, Dr. Beale still denies the presence of an interstitial connective-tissue, or fibro-cellular matrix, in the healthy kidney; but he admits of the existence of a small quantity of transparent, faintly-granular material, with distinct nuclei. We are surprised to see that no notice is taken of the work that has been recently done in Germany on the arrangement of the uriniferous tubules. The author just alludes, in a later part of the book, to Henle's views on the subject, but merely to refute them as unsatisfactory, without discussing the question. Henle asserts—basing his assertion on the results of numerous injections made from the ureters—that there are two distinct systems or sets of tubules in the kidney; one set closed—i.e., having no outlet whatever into the ureter, the other set opening into the ureter, in the way heretofore described as the regular way. The former are alone connected with the Malpighian capsules, are the convoluted tubules of the cortex, on reaching the bases of the pyramids, pass into them, but, instead of running down to open into the calices, bend back at varying distances from the papilla, and run up again into the cortex; they never branch, and never anastomose, and they are nearly filled with a granular epithelium. The latter have no connexion whatever with the Malpighian bodies, are larger than the convoluted, anastomose freely with one another as they run up the kidney, through the cortex, on their way to the surface, and give off, at a right angle, numerous branches, which bury themselves amidst the mass of convoluted tubules around them, and terminate in an irregularly-meshed network. They are lined, in the first part of their course (that nearest the papilla), by cylindriform epithelium, which gradually assumes a flat and rather scaly form, and is not granular. This complete subversion of the doctrines promulgated by Bowman has brought into the lists several German combatants, and foremost among them Hyrtl. Hyrtl has, like Henle, failed to inject from the ureters the Malpighian capsules in birds and mammals; he has, however, succeeded in the Cyprinidæ and in the tailless Batrachia; but, even in these, only some of the capsules were filled; so that there still remains the possibility that only a part communicate with open tubules in these animals, and that Henle's views concerning the human kidney may be correct. Colberg, of Halle,[1] has worked at the subject most laboriously. Using Beale's blue injecting fluid, and injecting from the ureter the kidneys of adult and fœtal mammals and birds, he finds, as does Henle, two forms of tubules, but not so entirely separated from one another as Henle supposes. Henle's closed or convoluted tubules start each from a single Malpighian capsule, pass in a convoluted form through the cortex, on reaching the pyramid become straighter, and at the same time narrower, and, running down a short distance (seldom more than half way) in the pyramid towards the papilla, bend back and turn up again to the base of the pyramid: here, however, they do not re-enter the cortex, but terminate by opening obliquely into one of the straight tubules of the pyramid. The straight or open tubules of Henle run up from the papilla to the periphery, giving off as they go lateral branches. Each lateral branch does not terminate in a closed network, but ends in a Malpighian capsule. Hence all the Malpighian capsules communicate with the ureter, some directly—those, namely, which are connected with the lateral branches of the straight tubules; some indirectly—those, namely, which are connected with the convoluted tubules. The convoluted tubules are very difficult to inject; it may be done if only slight pressure be used in the operation; but if any force be employed, the straight tubules in the pyramid are too forcibly distended, and the mouths of the convoluted tubes, which open obliquely into the straight, are closed up. He has several times succeeded in injecting from the ureter isolated Malpighian capsules in the adult pig, but it may be done with comparative ease in the embryo. Lastly, Schweigger-Seidel[2] concludes that there are two sets of tubules, forming one system, in the kidney; that these two sets are not distinct, but that they communicate one with the other, not, as Colberg supposes, in the pyramid, but at their terminations in the peripheral layer of the cortex. The question, therefore, does not seem to be so clearly decided in favour of Bowman, as Beale maintains. It seems probable that all the tubules communicate with the ureter, but it is doubtful if their course and direction, as described by Bowman, are in every respect correct.

In treating of the *physiology*, he introduces his new theory of "germinal matter" and "formed matter." In this, as in the preceding edition, he denies the existence of a cell-wall in the renal epithelium, and supposes that the outer granular matter (formed material—i.e.,

[1] Central-blatt für die Medicinischen Wissenschaften. Berlin, 1863. No. 48.
[2] Central-blatt, 1863. No. 53.

cell-contents) is slowly converted into soluble substances by the action of oxygen dissolved in the water which is discharged from the vessels of the Malpighian body. He thinks the suggestion of Goodfellow, that the intertubular capillaries are for the nutrition of the tissues of the kidney, untenable, and still maintains that the views of Bowman are correct. Concerning the influence of alcohol on the kidneys, he believes that the morbid changes to which it gives rise are not the direct effect of the alcohol, but are the result of *some change produced in the blood* by the alcohol. His reason for rejecting the simple and, to many of us, satisfactory, explanation that was before offered, as regards the effect of alcohol on the liver and kidneys—viz., that the changes are brought about by the irritant effect of the alcohol itself—does not appear to us sufficient. "In all cases," he says, "in which renal disease results from spirit-drinking, the kidneys are by no means the only organs affected;" implying that there must be consequently some change in the blood, and that this change is due to alcohol. But surely it is at least quite as reasonable to believe that the changes produced in the blood, and the consequent affection of other organs of the body, are secondary effects of the disease of the kidneys, as to suppose that alcohol causes these changes. Pathologists will look for some weightier argument than the above, to make them reject the simple theory that alcohol irritates directly the kidneys, and that other organs are secondarily affected in consequence of the primary renal disease.

In speaking of the *sulphur compounds*, he remarks that a strong odour of sulphuretted hydrogen in the urine is caused, probably, by the decomposition of substances rich in sulphur. We would add that, in some of these cases, cystine, in form of calculus, is certainly present. We examined, in Heller's laboratory in Vienna, from day to day, a case of urine of the kind, in which large quantities of cystine were passed, and, on one occasion, a calculus of the size of a pea composed of pure cystine.

Rather more importance is attributed to *diabetes insipidus* in this edition than in the former one. The author is now partly convinced of its morbid nature; for, he says, "in some cases, there is undoubted evidence of chronic renal disease." Trousseau, who has treated a number of these cases, gives a short but interesting lecture on the subject in vol. ii. p. 160, of the 'Clinique Médicale.' The polyuria is attended with polydipsia, and is closely akin to diabetes proper. This relation is shown by C. Bernard's experiments, and by the fact that children of diabetic parents are not uncommonly affected with diabetes insipidus. "I have had the misfortune," says Trousseau, "to see almost all those affected with polyuria whom I have treated die rapidly—more rapidly, indeed, than my diabetic patients." Generally, after the disease has progressed a certain time, it is followed by diarrhœa, great wasting, and, in many instances, phthisis. He regards it as dependent on a disturbance of the nervous system—a view which may perhaps derive support from the fact that the only medicine which seems to have any influence on the disease is valerian in very large doses.

A good *résumé* of what is known on the subject of *diabetes* will be found—Pavy's doctrines being, of course, more particularly criticized. The author thinks that "more conclusive experiments are required before we shall be justified in giving up Bernard's views." Pieces of liver removed from animals *at the instant of death* have been shown by Harley and Sharpey to give a decided sugar reaction; but this reaction is believed by Pavy to be the result of post-mortem change. Beale remarks that the liver-cells are most likely to agree in character with the cells of glands and secreting surfaces generally, and therefore to continue to perform their functions for some little time after death. "Actual demonstration is required before a view, which supposes the changes occurring a few seconds before death to be essentially different from those taking place a few seconds after death, can be accepted." Further, Thudichum has shown that Pavy's method of preventing the post-mortem change from taking place, and preserving the liver in its natural state, by injecting the liver, while still warm, with a strong solution of potash, is fallacious. This method has merely the effect of decomposing the sugar which is present; for when air, potash, and sugar are mixed together, the sugar is decomposed.

The question of *uræmia* is discussed at length. It is considered to be still *sub judice*, though the opinion of the author is, "that an accumulation of urea and, probably, other urinary constituents, will give rise to uræmia, as soon as the proportion reaches a certain amount." Munk, of Berlin,[1] has just published some interesting papers on this subject. After a critical review of all the different theories, with which every book on urinary diseases abounds, he concludes, from experiments on animals, that Traube's views are more nearly correct than those of any other observer; that the symptoms of uræmia are caused by œdema of the brain, which results from excessive dilution of the blood-serum, together with excessive tension in the aorta. Munk tied the ureters of a dog, and then, after placing a ligature on the jugular vein, injected, with considerable force, water into the carotid. The dog became at once violently convulsed, and coma followed, lasting till its death, eighteen hours later. On the other hand, he tied the ureters in some animals, and extirpated the kidneys in others, and found that, if he tied the carotids at the same time, and thus prevented an increase of pressure in the arteries of the cerebrum, neither convulsions nor coma followed. From whence, he thinks, may be derived two important therapeutical indications: first, to get rid of the water of the blood as fast as possible; secondly, to compress the carotids. The pages devoted to the clinical history of *hæmaturia*, although they enumerate all the different sources from whence the blood *may* flow, do not supply sufficient information concerning the points to be looked at in any given case, in order to determine the source from whence the blood *does* flow. A practitioner, who has a puzzling case of hæmaturia, and refers to these pages for help, will not be content to find that blood *may* come from the kidney, *may* depend on a calculus, *may* be due to disease of the prostate or bladder; he wants to know exactly what he is to look for, as regards the manner in which the blood is

[1] Berl. Klin. Wochenschrift, 1864. No. 11.

discharged, the quantity passed, the presence or absence of pain in certain parts of the tract, the presence or absence of various deposits in the urine together with the blood, &c., to enable him to exclude this organ and fix on that as the source of the hæmorrhage. The great fault in the system of medical instruction in England (looking at the question generally) seems to be just of the kind here noticed—that a variety of medical knowledge is imparted to the student in the form of lectures, but is not serviceable to him in that it is not, strictly speaking, clinical. We well remember listening, during the first three or four weeks of two winter sessions in London, for the space of two hours on alternate days, to a lecture on *inflammation.* The Professor of Medicine opened the ball with this most important subject; and we were all now hot, now cold, in following him through the different stages of congestion, inflammation, and mortification. The Professor of Surgery followed suit in the evening; and we had the satisfaction of studying a second time the changes which take place in the capillaries of an irritated rabbit's ear; till, at the end of the fourth week of the third session, we remember our despair at not being able to state positively whether a redness in a patient's leg was congestion or inflammation. A competent clinical teacher can make known to his class all that is to be taught in medicine far better at the bedside than in the amphitheatre. Any one who has listened to Oppolzer or Skoda, of Vienna, must be convinced of the great advantage that the Viennese student has, in this respect, over the English. We hope to see the day when medical teaching in this country will be more strictly clinical—when far less importance will be attached to *paper-work,* and far more to real clinical knowledge, in our medical examinations.

Lastly, an account of the way in which the principal urinary diseases ought to be treated renders this edition much more complete than the last. The student will find just what he requires in a condensed form —no extensive prescriptions, but when and how to employ the few drugs that are of real service.

Review IV.

1. *A System of Surgery.* By James Miller, F.R.S.E., F.R.C.S.E., Surgeon in Ordinary to the Queen for Scotland, Professor of Surgery in the University of Edinburgh, &c. &c.—*Edinburgh*, 1864. 8vo, pp. 1379.
2. *The Science and Art of Surgery.* By John E. Erichsen, Professor of Surgery and of Clinical Surgery in University College, and Surgeon to University College Hospital. Fourth Edition.—*London*, 1864. 8vo, pp. 1280.
3. *The Principles of Surgery; Clinical, Medical, and Operative. An Original Analysis of Pathology systematically conducted, and a Critical Exposition of its Guidance, at the Bedside and in Operations. Representing the Principles of the earliest and most exact Diagnosis, Etiology, Prognosis, and Therapeutics, Medical and Operative.* By James Gant, F.R.C.S., Surgeon and Pathological Anatomist to the Royal Free Hospital, &c. &c.—*London*, 1864. 8vo, pp. 860.

If it is necessary for a reviewer to read every word of the books which he undertakes to criticize, we fear we are not in a position to pass an opinion upon the volumes whose titles are prefixed to this article. They are closely printed in octavo, and one numbers 860 pages, another 1280, and the third 1379! We do not pretend to say that we have perused from beginning to end all these lengthy treatises. But what we *have* done is this—with regard to the two former, which are only new editions of works that have been long before the profession—we have looked over them in such a way as enables us to form an opinion of their merits; while with regard to the latter, which is a new book —new in arrangement as well as new in form—we have felt it our duty to read it fully before we presumed to offer any remarks upon it.

But, in truth, the perusal of these works is a task which requires no small patience, for they are none of them written in an attractive style. They strain the attention, and weary the mind. *Hic labor, hoc opus.* In reading them, one cannot help longing for the graphic descriptions of John Bell, or the easy and graceful writing of Sir Astley Cooper. Were it not that we are afraid of adding another to the list of ponderous treatises on the subject, we would venture to suggest how useful it would be if some one would do for surgery what Dr. Watson has done for medicine—that is to say, surround the subject with all the charms of style, anecdote, and illustration, so that the study of it shall no longer be dry and tedious, but full of interest and pleasure. It is true Sir Astley Cooper, John Bell, and others of older date, have done just what we describe; but their writings are a little behind the present day, and hardly meet the requirements of modern science.

To return, however, to the volumes before us. Professor Miller meets us with a 'System of Surgery.' The two volumes which he published a few years ago, one on the principles and the other on the practice of surgery, have now been combined into one ponderous tome, and a perfect encyclopædia of the subject it is! No doubt the Professor thinks that a "system" may be better written by one author than by many, and very likely he is right. In the case of a book intended for the use of students there can hardly be any doubt about it. Repetition is avoided, space is saved, and the instruction given is uniform and definite—all of which are matters of importance. These characteristics mark the volume we are now considering. The student will here find the principles of surgery set forth in the light of modern research, and the most recent operations and methods of treatment described and estimated. But we doubt whether students will make much use of Professor Miller's work. As a book of reference for practitioners it will be of great service. So large a volume could only be made attractive to students by being written in an interesting way, and, unhappily, the style in which Professor Miller writes is far from attractive. Indeed, the most serious fault that we have to find with him is that he is obscure and pedantic. The first step in teaching is to make the subject interesting to one's hearers; the next is to treat it in the plainest and simplest way. To make the acquisition of knowledge a pleasure, and to make hard things easy, these are the secrets of successful teaching. But these are gifts which Professor Miller does not seem to possess. To tell a student that the treatment of erysipelas "should not be abortive or ectrotic," is not the way to induce him to inquire what the treatment *ought* to be. New words, difficult to be understood, besides being open to other objections, are so many hindrances to the acquisition of knowledge, and ought especially to be avoided in a book intended for those who are entering the profession.

Professor Miller devotes a large share of space to the diseases of the eye, and even describes the ophthalmoscope and its uses. No doubt it is very necessary that all surgeons should be acquainted with the more common and obvious diseases of the eye, which form so large an item in general practice; but we fear the more subtle disorders which are brought to light by the ophthalmoscope can hardly fail to constitute a special branch of study.

In speaking of the laryngoscope, the Professor points out the difficulty there is in depressing the tongue below the level of the lower teeth; but he omits to mention how easily this difficulty may be overcome by laying hold of the tip of the tongue with a napkin or handkerchief, and putting it on the stretch by drawing it gently forwards.

Since this volume was put into our hands the author has passed away from among us. Prof. Miller's life has come to rather a sudden and premature close. His varied earthly labours have terminated; but his 'System of Surgery' remains, as the expression of his matured opinions, and as a book of reference which will be particularly useful to those who have had the advantage of receiving his instructions and attending his lectures during the time that he has filled the chair of Surgery in the University of Edinburgh.

Mr. Erichsen's work is well known to the profession, and highly valued. Its popularity is shown by the fact that another edition is called for so soon after the last, which was published in 1861. The present edition has been enlarged by the addition of some 120 pages. The text has been carefully revised, and much new matter added, so as to bring it up to the level of modern science. It is not a lively book, nor does it attempt to "combine amusement with instruction;" but it is full of sound information and advice, conveyed in clear and simple language.

These two treatises belong to the same class, and differ widely from the other which we have to notice. They are both systematic works: they both comprehend the principles and the practice, the science and the art, of surgery; they are both written by men of great knowledge, deep research, and long experience; they both contain a vast amount of information, and we have no hesitation in saying that the one or the other of them ought to find a place in the library of every practitioner.

Mr. Gant's book is of quite a different kind. It belongs to a class of which it is, as far as we know, the only representative.

"The foundation and object of this work are conspicuously different from those of other works entitled 'principles,' or 'principles and practice,' of surgery, and systematic works of similar purpose, if not so named; all of which, however excellent and valuable in their way, are systematic compilations of 'general pathology and therapeutics.' Unlike any course of general pathology and therapeutics, the principles I have advanced are coextensive with surgery (and medicine concurrently) in its four departments—diagnosis; etiology, with regard to 'internal' causes and their operation; prognosis; and therapeutics, medical and operative. . . . . Collectively, they represent and express the guidance of pathology at the bedside and in surgical operations and manipulations; and *clinical* pathological anatomy, as I have named this latter science, when thus applied during life, is shown to give birth to principles, and of the *earliest* and *most exact* standard, in each of the aforesaid departments of surgery."

A short historical sketch is given of the various phases through which the study of medicine has passed according to the science, be it chemistry, physiology, or anatomy, which prevailed at the time. The anatomical era, represented by Sir Charles Bell, has passed away, and we have now arrived at the "pathological epoch."

"Slowly, as out of a mist, the pathological man, clad in the tattered garb of disease, approached, and crept by stealth into the anatomical theatre. The teaching of the schools, and their books on operative surgery, thenceforth underwent *some* improvement, and advanced *somewhat* nearer to the requirements of the practical surgeon."

Much might be quoted to the same purpose. We have, however, extracted these passages in order to give our readers a glimpse of Mr. Gant's style, and to let them know in his own words what is the aim and scope of his work.

It is, then, pathology, or rather "clinical pathological anatomy," which, in Mr. Gant's opinion, is to conduct us to the true principles of surgery; and in order to arrive at these principles, he proposes to make a systematic analysis of the facts brought to light by pathology. Taking these facts as they are found in the works of Paget, Hughes Bennett, and other English and foreign writers, Mr. Gant endeavours to deduce from them certain general principles of universal application, which would form the basis of surgical science, and on which a number of subordinate principles might be founded. His book is divided into four sections—Diagnosis, Etiology, Prognosis, and Therapeutics—and under each of these heads he aims at pointing out how far pathology is a safe and trustworthy guide, and how far other considerations would influence our judgment. In each of these departments he lays down and discusses "principles;" and in order that our readers may be able to judge for themselves of their nature and value, we shall quote those which are the subject of chap. xiv., on "The superior Prognostic Value of Pathology;" without, however, giving any of the "sub-principles" founded upon them.

"Principle I.—The comparative functional importance of any texture or organ *determines* our prognosis, unfavourable or favourable, respecting the course and tendency of any morbid condition of structure it may have undergone.

"Principle II.—Local disease or injury, *per se*, suggests a favourable prognosis.

"Principle III.—Local disease or injury, sustaining, or sustained by, some constitutional disorder, suggests an unfavourable prognosis.

"Principle IV.—Constitutional diseases, implying each some morbid condition of a texture or textures of general distribution, as well as of predominant functional influence throughout the system, suggest an unfavourable prognosis."

We have selected these as favourable specimens of the "principles" which Mr. Gant lays down. They are short and tolerably definite; whereas many of his "principles" are long and wordy, and ought rather to be called opinions or judgments. Our readers will be able to estimate how far such "principles" are likely to help forward medical science, or to conduce to a better system of surgical teaching. For ourselves, we are strongly inclined to think that the time has not yet arrived for drawing any general conclusions from pathology. For many years to come we must be engaged in observing and collating facts before we shall be able to lay down principles which shall be of any practical value. We fear it will be long, very long, before medicine and surgery can either be studied or taught with any advantage in the way that Mr. Gant seems to propose.

Our author finds fault with the way in which the term "principles of surgery" has been used by former writers. He says their works are nothing more than "systematic compilations of general pathology and therapeutics." But we would ask, are the principles with which he has furnished us the principles of surgery? Are they not the principles of pathology? And as they are intended to extend to medicine as well as surgery, what are they but the principles of general pathology?

That pathology is a most important science, which should receive every encouragement, and which is likely to lead to great results, we willingly allow. We should be glad to see it hold a higher place in the curriculum of medical study than it commonly does. But still we cannot agree with Mr. Gant, that it is of more importance to the surgeon than a knowledge of anatomy. Anatomy—the anatomy of the dissecting-room—is the very foundation of surgery. To know the relative position of parts in their normal condition is the first step towards recognising the alterations and displacements produced by disease. Unless a surgeon is familiar with the structure of the body he can hardly perform the most trifling operation without anxiety; and as anatomy is the foundation of the *healing art*, so is physiology the foundation of the *science of healing*. It is, therefore, in our opinion, quite right that a knowledge of these two subjects should form the basis of medical education. To understand the structure and functions of the human body in health is essential to the rational and intelligent treatment of disease; nor can pathology be studied to any advantage until some considerable progress has been made in anatomy and physiology.

In perusing Mr. Gant's book, we have repeatedly asked ourselves for whose benefit it has been written—for what class of readers is it intended? Not surely for students, because it contains no systematic instruction, and it presupposes an amount of knowledge which very few men in their third year possess. Not surely for practitioners, because they can find what they want much more clearly and fully set forth in systematic works on pathology; while as a guide to "the earliest and most exact diagnosis" (to use the author's oft-repeated expression), it is really of no practical value.

Mr. Gant shows considerable research. He has brought together many interesting facts from a variety of sources to illustrate the principles which he lays down. Moreover, he writes with facility; he has the art of weaving words, but his meaning is not always apparent. One often has to read a sentence over two or three times before one can make out what it is intended to convey. This is a serious fault, particularly in a book which professes to set forth new views. The author does himself an injustice by his want of clearness and perspicuity. Many a one who takes up his work will lay it down again with an unfavourable impression, simply because he is unable, at first sight, and without an effort, to comprehend the author's meaning.

Review V.

Transactions of the Obstetrical Society of London. Vol. V. For the Year 1863.

The present volume of the 'Transactions of the Obstetrical Society,' besides a list of the officers, fellows, &c., contains a series of forty papers, together with abstracts of discussions by which the papers were usually followed. Both the papers and discussions are of a practical character, some having reference to important points in obstetric medicine or in the treatment of diseases peculiar to women, and others recording rare or extraordinary instances of disease or malformation of the female generative organs. The following is an abstract of the subjects brought under notice in the present 'Transactions.'

I. *On Vaginal Lithotomy.* By J. H. Aveling, M.D.—The author remarks that nature has two ways of ridding the female bladder of stones—namely, by expelling them through the dilated urethra, or by establishing an opening in the vesico-vaginal septum, and thus allowing them to fall into the vagina; the latter, however, being a very uncommon occurrence. He then relates the history and progress of vaginal lithotomy from the latter part of the sixteenth century up to the present day, when, in consequence of the improved method of treating vesico-vaginal fistula, the success of the operation is very much promoted. He then describes a case treated by himself, which was followed by complete recovery. The operation was easily performed, and a small rough stone was extracted; and after the bladder was well syringed out with warm water, four sutures of silver wire were passed through the lips of the wound, and their ends run through eight or ten gilt beads, which were kept in their proper position by perforated shots. Seven days after the operation the wound was healed, and in a short time afterwards the sutures were withdrawn, and the urine was retained and passed in the natural manner. The medical treatment consisted of the administration of opium immediately after the operation, the use of bicarbonate of potash to keep the urine alkaline or neutral, and an enema of castor-oil on the eighth day. Instead of the gilt beads employed in this case, Dr. Aveling proposes in future operations to employ a fine coil of wire, for which he suggests the name of the *coil-clamp.* A question may be asked as to the steps to be adopted in case a pregnant woman is found to have a stone in her bladder, and whether it should be left alone, or some operation be performed for its removal? To this question Dr. Aveling replies that the testimony of facts seems to be in favour of removing the stone if its presence should be detected during pregnancy, because very serious consequences have resulted from the calculus coming down before the child's head during labour.

II. *On Vesico-Vaginal Fistula, the Mode of Operating, and the Results obtained in Fifty-five Cases, at the London Surgical Home,* By I. Baker Brown, F.R.C.S.—The reasons which induced Mr. Brown to bring the above subject before the Society were, 1st, That vesico-vaginal fistula can be very readily cured by operation; 2nd, That the lesion is produced very generally by protracted labours; and 3rd, That the obvious inference is that we should never allow a labour to become protracted. Mr. Brown then describes the operation, which consists in paring the edges of the fistula, and then passing steel needles, with various curves, through the edges of the wound. The needles are armed with wires which, when the needles are withdrawn, are twisted round and round, so as to keep the edges of the raw surfaces in apposition. Mr. Brown finds this latter proceeding preferable to the use of shots, buttons, or clamps. A list is then given of the cases operated upon, setting forth the particulars of the labour from which the lesion originated, the nature of the fistula, the date of operation, and the result. The total number of cases operated upon in the London Surgical Home was 55, out of which 43 were followed by perfect cure, 1 was much relieved, 2 died, 5 were not cured, and 4 were under treatment, with every prospect of cure. Of the 58 cases admitted (three were not operated upon), 47 had been more than 24 hours in labour, and 39 were as much as thirty-six hours and more; 7 were two days; 16 were three days; 3 were four days; 2 were five days; 2 six days, and 1 seven days. In the whole number of cases instruments had been used in twenty-nine. Mr. Brown concludes that the cause of the lesion is protracted labour, and not the use of instruments, or deformity of the pelvis; and he thinks that vesico-vaginal fistula would scarcely ever occur, if a labour were not allowed to become protracted.

In the discussion which ensued upon the reading of the paper, Dr. Oldham differed with the author as to the employment of instruments, because he felt persuaded that their more frequent employment in labour would result in the laceration of the structures at the floor of the pelvis, particularly the laceration through the sphincter of the rectum. Dr. Tyler Smith would have agreed in the opinion of the author as to the use of instruments, if Mr. Brown had employed the term labour with impaction, instead of protracted labour.

III. *Case of Polypus Uteri complicating Labour, removed by Ligature two Days after Delivery.* By Henry L. Freeman, M.R.C.S.—The patient was thirty-seven years old, and when in labour with her fifth child it was discovered that the vagina was filled with a large soft mass, bigger than the child's head, which could be felt above the tumour. As the labour advanced the mass was entirely protruded, the head of the child followed it, and the body was expelled naturally, together with the placenta. Immediately after the birth, the tumour which had protruded was gently pressed back again into the vagina, where it remained for some time, but in two days it was again thrust through the external parts, and a thick pedicle could be felt high up in the vagina. It was now determined to remove the tumour, and a piece of strong whip-cord was tied round the part external to the vagina, and the mass was removed by the knife. The end with the whip-cord attached was returned into the vagina, but the ligature came away after a few days, and the patient eventually recovered without a bad symptom. The tumour weighed three pounds eleven and a half ounces, and presented somewhat of the appearance of placenta.

IV. *On Displacement of the Bladder as a Cause of Tedious Labour.* By W. H. Broadbent, M.D., M.R.C.P.—The object of the author is to describe a few points in obstetric practice, relating chiefly to some causes of protracted first stage of labour, and the paper is the result of certain observations made by Dr. Broadbent while holding the office of Resident Obstetric Officer at St. Mary's Hospital. The conditions of the bladder which Dr. Broadbent has found to interfere with the first stage of labour are—1. Complete prolapsus, with or without distension; 2. Partial prolapsus—namely, where the fundus remains between the uterus and symphysis pubis; 3. Distension when *in situ*; and 4, Irritability? Prolapsus does not occur suddenly during labour, but is present before impregnation, usually as a result of repeated child-bearing, and may occasion little or no inconvenience during pregnancy. But when labour commences, this condition of the bladder sometimes gives rise to serious trouble. Even when this viscus remains empty, the contractions of the uterus are soon accompanied with pain in the bladder from pressure or traction. The prolapsed condition of the bladder is readily recognised on examination when it contains urine in any considerable quantity; but when it is perfectly empty the displacement may be overlooked, except under careful manipulation, and the introduction of the catheter makes the case clear. Partial prolapse of the bladder is more likely to be overlooked than the complete, but the symptoms are usually even more severe than those of the latter. The treatment in such cases is simple, and consists in the early introduction of the catheter, more especially when there is an accumulation of urine; in placing the patient on her back in order to relieve the bladder from pressure; and the administration of chloroform, which stops the violent spasmodic action of the abdominal muscles, the latter being of a sensori-motor character, but not interfering with the proper uterine contractions. Dr. Broadbent then relates the particulars of eight cases illustrative of his observations, and the results were favourable under the treatment recommended.

V. *Observations on Ovariotomy, Statistical and Practical. Also, a successful Case of Entire Removal of the Uterus and its Appendages.* By Charles Clay, M.D., Manchester.—Since the year 1842, Dr. Clay has made the peritoneal section 116 times, and of these operations 108 were for the extirpation of diseased ovaries; 4 with the view of breaking up the tumour, which was too firmly and extensively adherent to be extirpated; 1 for the Cæsarean operation; and 3 for the entire removal of both uterus and ovaries. Of the 108 cases of ovariotomy, 74 completely recovered, many of the patients bearing children afterwards, and in only 2 cases did the disease return in the opposite ovary; 34 died, being somewhat short of the proportion of 30 per cent., and of these 10 died from shock, 10 from peritoneal inflammation, 12 from prostration, on or about the sixth or ninth day, and 2 from hæmorrhage.

Dr. Clay then adverts to a few points in the general management of the cases, and he first insists upon the necessity of having the temperature of the room raised to about 74° Fahr., as the cases so treated are less likely to sink from shock. In relation to chloroform, Dr. Clay doubts whether this agent has really added to the success of ovarian operations; and if it could be accomplished, he would infinitely prefer operating without it, as the patient would then bring to bear a greater amount of nerve and determination to endure the trial, and the distressing retching and vomiting which are so common after all great abdominal operations would be avoided. The first fourteen of Dr. Clay's cases were undertaken before chloroform was discovered, and nine of them recovered. Dr. Clay advocates and practises large incisions, so as to afford plenty of room for every manipulation; and he thinks this proceeding better than to be obliged subsequently to enlarge the wound, or to drag cysts or solid masses through small openings, without knowing what attachments may possibly exist behind.

For ligatures, he prefers those made of Indian hemp, as he does not find that metallic wires possess any positive superiority to justify their use, and he is not an advocate for the clamp. In attending his cases of ovariotomy, Dr. Clay has observed that there are certain periods when critical changes take place, and by watching them closely, he has been able to meet many difficulties; thus, if the patient does not sink immediately from shock—that is, within the first twenty-four hours after operation—the first critical day will be the third, and the next will be the sixth day; but if the patient passes the ninth day, the case assumes a very favourable aspect for recovery. In the after-treatment, Dr. Clay does not recommend purgatives, but depends as much as possible on the internal use of ox-gall, and the injection of gruel and castor-oil into the rectum. With regard to the age at which the operation is best borne, it seems to be the period of life when menstruation is about to cease, or has altogether ceased. Dr. Clay believes that ovariotomy is not a suitable operation to be undertaken in large hospitals, because it requires a great amount of personal care and superintendence on the part of the operator, such as cannot generally be secured in a public institution.

Dr. Clay then relates a very interesting operation of extirpation of the uterus and its appendages entire through the walls of the abdomen, the case terminating quite successfully. The patient was an unmarried lady, and the disease consisted of a mass of fibroïd tumours growing in the walls of the uterus and its cervix. Dr. Clay had performed this formidable operation in two other cases as far back as 1844; and in one of them the patient was going on well until the thirteenth day, when she had an accidental fall upon the floor of her room, resulting in local inflammation and death.

VI. *On a Variety of Chronic Pain in the Back.* By Henry Gervis, M.D., London.—The pain described by Dr. Gervis has been occasionally supposed to be dependent on uterine disease; but although it is one of the attendants or consequences of the parturient state, it appears to be due to a chronic congestive or sub-inflammatory condition of one or more of the tissues of one of the sacro-iliac synchondroses. Dr. Gervis relates a case which is a type of several he has seen, all of which present pretty much the same character, none of them having terminated fatally. The patient was a middle-aged woman, who had suffered from constant pain in the lower part of the back for six years after her confinement, but in whom there was no remarkable uterine irregularity; and no disease could be detected on examination. The case was treated by rest, the local application of blisters in narrow strips, and the administration of bichloride of mercury in decoction of cinchona, with extract of henbane and Dover's powder, and an occasional aperient. In less than eight weeks she was completely relieved from a pain which had previously scarcely left her for six years. Dr. Gervis thinks that the cases to which he refers are mild forms of an affection the severe form of which would be represented by abscess.

VII. *Case in which Amaurosis was observed Eight Times in Succession after Parturition.* By H. E. Eastlake, M.D., L.K.Q.C.P., Ireland.—The patient was a woman who had had nine children at the full time, and no miscarriages. The first labour was natural, and her eyesight was perfectly good, but on the second or third day after the birth of her second child, and after all her seven subsequent labours, she suddenly became totally blind in both eyes, and also partially unconscious; and when her senses returned, the amaurotic condition remained, and on an average lasted from three to five weeks. On the most careful investigation, no cause could be discovered for this amaurosis; and when the eyes were examined by the ophthalmoscope, the evidence adduced was entirely negative, except that there was a somewhat contracted state of the retinal arteries. From the absence of any other cause for the patient's temporary blindness, Dr. Eastlake would be led to infer that it was dependent in some way on the puerperal condition of the patient; but he has not succeeded in discovering a parallel case in the history of ancient or modern obstetrics. The only authors, so far as Dr. Eastlake can ascertain, who have recorded anything relating to this subject, are Beer, in the year 1817, and very recently Dr. Ramsbotham; but in the cases they have related there were concomitant circumstances showing congestion of the brain and irritation of the digestive organs.

VIII. *Case of Cæsarean Section.* By J. G. Swayne, M.D.—The subject of the operation was forty-two years old, and unmarried. She was pregnant about a year before, but had the good fortune to miscarry at the end of two months. On the second occasion of becoming pregnant, she said nothing about her condition until her full period had arrived, and labour pains had set in, when she was brought to the Bristol General Hospital. She was a dwarf, her height being only four feet and half an inch, and she was very much deformed: her head being as large as that of a full-sized woman, her trunk long in comparison to her whole height; but her limbs were very short, especially the arms. The pelvis, externally, did not appear to be very deficient in its transverse diameters, but the antero-posterior were evidently much below the average. It was ascertained that all this deformity was congenital, and not traceable to rickets or any other disease. She had been in labour about sixty hours before her arrival at the hospital; and when seen by Dr. Swayne her general condition was good, and there was no fever or heat of skin. The fœtal heart was distinctly heard with the stethoscope. On examination per vaginam, the finger at once touched a hard body, which was found to be the projection formed by the anterior part of the sacrum, and the os uteri, which was dilated to the size of a crown piece, could be reached only with great difficulty. Dr. Swayne estimated that the conjugate diameter of the pelvis, covered by the soft parts, could not be more than an inch and a half, and there was even less room at the sides of the pelvis. Under these circumstances it was determined to have recourse to the Cæsarean section, which was accordingly performed by the senior physician of the hospital. There was no difficulty in the operation, and the infant, although asphyxiated when first removed, was speedily restored by the Marshall Hall method of resuscitation. The day after the operation there were several unfavourable symptoms, and on the succeeding day the patient gradually sank, exactly forty-two hours after the operation. On the post-mortem examination, peritoneal inflammation was discovered, but not in a very well-marked degree; and there was hardly any serous effusion. The pelvis was taken out and measured, and presented a somewhat kidney-shaped form at its brim; the antero-posterior diameter, from the centre of the symphysis pubis to the second bone of the sacrum, was exactly one inch and eight-tenths, and, as was ascertained during life, the sides of the pelvis were even more contracted than the centre. The unfortunate result to the mother was evidently due to the shock of the operation and the subsequent peritonitis, and did not depend apparently on hæmorrhage or other accident arising from the proceeding. At the date of Dr. Swayne's report, the child was alive and well.

In the discussion which ensued upon the reading of the paper, Dr. Greenhalgh advocated the performance of the Cæsarean section (when it was permissible), at an earlier period than was usually selected, and Dr. Graily Hewitt spoke in favourable terms of the cephalotribe in some cases which had been thought hopeless. The general opinion seemed to be that the Cæsarean operation would be oftener successful if it was performed earlier.

IX. *The Galactagogue Properties of Faradization, with Eight Cases.* By Thomas Skinner, M.D., Liverpool.—The cases described by Dr. Skinner illustrate the specific effect of localized galvanism in increasing the mammary secretion, when it is defective or absent from atrophy of the gland, or mental emotion, or diminished nervous energy of the parts, or from mammary inflammation and abscess. In all the cases related the results were most satisfactory, although none of the patients had any faith in the plan when it was proposed to them; some of them laughed at it, and one was in positive dread of losing her situation from the failure of her breast milk. It may be, perhaps, necessary to mention that Faradization means the localization of the galvanic current, in contradistinction to the plan of passing it through distant parts of the body with the poles wide asunder. The instrument recommended by Dr. Skinner is the electro-galvanic coil machine, and the current is obtained from chemical decomposition, the battery being composed of from three to six of Smee's cells. The mode of applying the current is by—1st, pressing the positive pole (which terminates like the other pole, in a cylinder, at the end of which is a piece of sponge well moistened with tepid water) into the axilla, while the negative pole is lightly applied to the nipple and the areola, but the current should never be stronger than is agreeable to the patient's feelings; 2nd, by pressing the two poles into the mamma on each side of the nipple, and then raising and re-imbedding them, observing that both poles are raised and re-imbedded together. This is to be done all round the nipple and all over the breast, so as to stimulate not only the gland, but also the descending superficial branches of the cervical plexus, and the thoracic and the cutaneous branches of the intercostal nerves supplying the mammary gland and its integument. Dr. Skinner, while strongly recommending Faradization, regards it only as an agent which stimulates the performance of the natural functions.

X. *Medical History of Woman in Southern India.* By John Shortt, M.D., Chingleput, Madras.—In this communication Dr. Shortt describes the ceremonies performed at various periods of woman's life in the four principal castes of Southern India—namely, the *Brahmins*, the *Hindoos*, the *Mahomedans*, and the *Pariahs*, and he gives some particulars illustrating the state of obstetric practice in that country. Among many other particulars Dr. Shortt observes, that in tedious or unnatural labours the native midwives are at a loss what to do, and are unable to render any assistance; but some will try to extract the child from the vaginal orifice by dragging, and pushing their forefinger in the child's axilla and pulling, and if these means fail they leave the case to nature as being hopeless, or they apply for European treatment. They place great confidence in charms and incantations, and employ them when all other means have failed; and among Mussulmen great faith is placed in a few words from the Koran written on a piece of paper, and chewed with some water. Stimulants are employed after delivery, and cloths steeped in brandy or other spirits are frequently introduced into the uterus and passages, by which means violent inflammation is often induced. It may easily be understood that the most serious results sometimes ensue from the peculiar mode of treatment adopted by the natives. When European aid is at last sought for, the patient is in a most exhausted condition, the passages being enormously swollen, the uterus paralysed, the child usually dead, the bladder distended, the arms or funis of the child perhaps extruded, and a number of other serious complications induced which might have been averted if timely aid had been procured. Even under the aggravated circumstances alluded to, the majority of the mothers are saved if they are allowed to remain in the hospital after their confinement.

XI. *Fibrous Polypus of the Uterus.* By Graily Hewitt, M.D.—The patient in this case was forty-three years of age, and had suffered from flooding for two years; but as she believed it to be due to "change of life," she sought no advice until a very severe hæmorrhage occurred. It was then discovered, on examination, that there was a hard, rounded, pedunculated tumour in the vagina, the size of an egg, just outside the os uteri. The tumour was removed by cutting the pedicle across with a pair of scissors. No hæmorrhage followed, and the patient recovered. Dr. Hewitt said that the chief interest attaching to the case arose from the fact that the nature of the disease was so long unknown and unsuspected by the patient.

XII. *Further Observations on the Use of Anæsthetics in Midwifery.* By Charles Kidd, M.D., M.R.C.S.—In this paper Dr. Kidd brings before the Obstetrical Society some observations in addition to those which he made in a former communication; and he divides his remarks into three sections: 1. The result of subsequent experience as to the caution to be observed in cases of midwifery attended by severe hæmorrhage. 2. The great value of chloroform in cases of retained placenta. 3. The utility of alternating the administration of ether with that of chloroform, when the pulse sinks, as in some exhausting operations, such as ovariotomy. 4. The suggestion of a new mode of resuscitation in impending death from chloroform—namely, the "Faradization" current, applied, not to the heart, as heretofore, but to the phrenic nerve and diaphragm.

In the discussion which ensued after the reading of the paper, Dr. Hall Davis, while admitting the value of chloroform in certain cases of midwifery practice, thought that it sometimes gave a feeble character to the pains, so as to occasion a lingering labour, and that by lowering the muscular power of the uterus, it left a tendency in the uterine fibres to relax, and thus permitted uterine hæmorrhage after delivery—a result which had frequently occurred in his practice after the use of chloroform. Dr. Davis had, however, met with only one death after chloroform in obstetric practice, and even in this case the fatal result could not be fairly attributed to the employment of the anæsthetic. Dr. Routh entertained also a rather unfavourable opinion of the use of chloroform in midwifery; but most of the other speakers, including Dr. Murphy, Dr. Rogers, Dr. Hewitt, Dr. Martyn, and others, considered it a most valuable agent, and unproductive of any dangerous consequences.

XIII. *Case of Uterine and Extra-uterine (Fimbrial) Pregnancy, progressing simultaneously to the Full Period of Gestation. Death. Post-mortem Examination.* By Louis R. Cooke, M.R.C.S. Eng.—This was a very extraordinary and unique case, establishing the fact of the co-existence of a uterine fœtus with one in the fimbriæ of the Fallopian tube, both reaching the full period of pregnancy. The patient was thirty-nine years of age, and went through her fourth pregnancy without any remarkable symptoms; but when she was in labour for the fifth time, the abdomen presented a peculiar appearance, at first resembling that of ovarian disease; but the limbs of a child being distinctly felt within the tumour, this view was untenable. On examination by the vagina, the canal was found much elongated, and the os uteri was drawn up so far as to be out of the reach of the finger, so that it seemed possible the uterus was unimpregnated. But on further careful examination, it became probable that there was a double uterine fœtation, for the placental souffle was heard over a large surface, and the sounds of two fœtal hearts, in two distinct situations, were recognised. It was now determined to wait the result, after emptying the bladder and administering a grain of opium. The next day the pains set in very strongly, and now it was found that the os uteri was fully dilated, but that the expulsion of the child was prevented by a firm, resisting, rounded tumour in the sacral cavity. The course pursued was, to place the woman under chloroform, and to raise the tumour (which was subsequently found to be the other fœtus) out of the pelvis, so as to allow version of the first fœtus to be effected. This was done, although with great difficulty, and a dead child was removed by grasping the legs and drawing the rest of the body through the vulva. The placenta was removed soon afterwards without difficulty; but although no very remarkably unfavourable symptoms presented themselves, the patient never rallied, but sank from exhaustion two days after delivery. On a post-mortem examination, it was found that the cavity of the abdomen contained the body of a full-grown fœtus, contained in its membranes, which were unruptured and full of fluid. The anterior surface of the chorion was in immediate relation with the abdominal peritoneum, to which it was not adherent, nor was it enclosed in a capsule of any sort; and beneath the tumour the uterus was found rather contracted and *unruptured.* On opening the fœtal membranes and removing the fœtus, it was found attached to the placenta by an unusually long umbilical cord, and the placenta occupied the inner surface of the fimbriæ of the right Fallopian tube, which had expanded into a shallow capsule for its attachment, leaving the containing membranes of the fœtus free from any covering except the maternal abdominal parietes. Some discussion ensued, after the reading of the paper, as to the course which ought to be pursued in case such an anomalous condition should again occur, and should be discovered during the life of the patient, and whether gastrotomy would be justifiable: if the extra-uterine child were alive, such a course might, perhaps, be successful; but if it were dead, it would be better to leave it in the abdomen.

XIV. *Case of Interstitial Fœtation.* By Dr. Greenhalgh.—This was a specimen of interstitial extra-uterine fœtation, removed from the body of a patient who had reached the fourth month of pregnancy without any abnormal symptoms, and who died in a few hours from the effects of internal hæmorrhage, which, upon opening the peritoneal cavity, was found to proceed from the attachment between the uterus and placenta, which had partly given way.

XV. *Case of Tubal Gestation. Death.* By John Marshall, Esq. *Description of the Condition of the Parts involved; with Remarks.* By Graily Hewitt, M.D.—The patient was a married woman, aged about twenty-seven, who had previously borne two children, and who, when about two months pregnant, was seized with pain at the epigastrium, vomiting, and prostration of strength. It was ascertained that she had taken some liquid drug, with the object of procuring abortion; but, as it turned out afterwards, this circumstance could have had but little influence upon the result. Remedial measures were unavailing, and she died; and on a post-mortem examination the pelvis was found full of blood, several large clots completely filling the cavity. There was a large clot in the left ovary, and the Fallopian tube of this side was found to be ruptured. Dr. Graily Hewitt, in describing the specimen, pointed out that the uterus was an inch longer than in the unimpregnated state; that the left Fallopian tube was distended through the greater part of its extent by a mass, partly coagulum and partly placental in its nature, and that the fimbriated extremity was connected by inflammatory products with the coagula of blood found in the pelvis. This Fallopian tube had also been ruptured, and a portion of its contents hung out of the aperture by a kind of pedicle. It was pervious at its junction with the uterus, but only for the space of about a quarter of an inch, where a stricture existed, leaving the rest of the tube again pervious. The fœtus was not found, and it had probably escaped into the peritoneal cavity, and become surrounded by coagula. The explanation of the case offered by Dr. Hewitt was, that the stricture in the Fallopian tube was, in all probability, the cause of the tubal pregnancy, the canal being, perhaps, sufficiently patent to admit the passage of the spermatozoa, but not of the ovum; and thus the latter became fixed in the Fallopian tube, which was ruptured about the second month of pregnancy, this being the period generally found to be fatal in such cases.

XVI. *Sequel to a Case related in Vol. IV. of the 'Transactions' of the Society, of Retained Menses of Two Years' duration, caused by Atresia Vaginæ, and treated by Puncture of the Uterus per Rectum.* By I. Baker Brown, Esq., F.R.C.S.—In this case Mr. Brown had brought down the history until February, 1862, when there existed a fistulous opening between the uterus and rectum; but this opening subsequently closed, and the uterus was again tapped by the rectum. He afterwards introduced a trocar, and allowed it to remain for two months, during which period the patient menstruated by the urethra; and since the removal of the instrument she had menstruated twice by the urethra, and once the menstrual fluid came away by the rectum as well as by the urethra.

XVII. *Some Remarks upon the Treatment of Mechanical Dysmenorrhœa and Sterility, with a Description of a New Metrotome.* By Robert Greenhalgh, M.D.—In this paper the author advises a partial division of the os and cervix uteri in certain cases of mechanical dysmenorrhœa accompanied by sterility. He had previously adopted the plan of dilatation of the parts by bougies, as suggested by Dr. Mackintosh, but found the plan unsuccessful, and he therefore divided the parts instead of dilating them, and obtained very satisfactory results. But having nearly lost one patient from hæmorrhage after the adoption of this plan, he returned to dilatation, with no more success than before, and he reverted to the plan of dividing the os and cervix, but with an instrument by means of which the operation might be safely performed. This instrument Dr. Greenhalgh proposes to call the bilateral metrotome: it is constructed by Messrs. Weiss. It consists of two lateral halves, each having a blade, and they are made to cut from within outwards, by means of a screw adjusted to the handle. Dr. Greenhalgh states that he has divided the os and cervix uteri with this instrument in upwards of thirty cases without a single casualty, and in many cases with very favourable results. The affections in which he has found this plan especially serviceable, are: 1. Dysmenorrhœa, congenital and induced. 2. Sterility, when there has been more or less obliquity of the uterus, with a small external os uteri. 3. Endometritis, when accumulations of muco-pus take place in the uterine cavity. 4. Fibroïd disease of the uterus, accompanied with great pain and discharges of coagula. 5. Suspected and determined cases of intra-uterine polypus.

XVIII. *A Case of Fibroïd Tumour, situated in the Anterior Wall of the Uterus, and obstructing Labour.* By Robert Barnes, M.D., F.R.C.P.—The patient died apparently from rupture of the bladder during labour. A hard tumour of the fibroïd kind was found in the anterior wall of the uterus at its lower part, and it seemed probable that this tumour had been driven down before the child's head, and jammed against the symphysis pubis, closing the urethra. Little was known of the history of the case, but the parts found after death were exhibited by Dr. Barnes.

XIX. *A Case exhibiting the Association of Spina Bifida with Hydrocephalus.* By Robert Barnes, M.D.—The association of spina bifida with hydrocephalus does not appear, according to Dr. Barnes, to have received the attention it deserves. He has himself noticed it in several instances, and it would probably be more frequently witnessed if it were not usual for children with spina bifida to die soon after birth, before the hydrocephalic complication has had time to develop itself. Mr. Hutchinson believes that the two affections owe their origin to a strictly analogous condition of the neural membranes, and therefore their occasional coincidence becomes intelligible. In the case recorded by Dr. Barnes, the child was born with spina bifida, and hydrocephalus did not supervene till nine months after birth. When the child was a year old there was an advanced condition of hydrocephalus, and a large tumour in the lumbar region.

XX. *Face Presentation.* By Robert Barnes, M.D.—A stereoscopic photograph represented the head of a living child born by face presentation, and it exhibited in a marked degree the distortion produced during labour with this presentation when the cranium is plastic. Dr. Barnes observed that the child would probably retain in after life, in some degree, the peculiar moulding of the head imparted to it during birth.

XXI. *Case of Tuberculosis of the Uterus.* By Robert S. Tomlinson, Esq., M.R.C.S.—The patient in this case was a single lady, aged fifty-five, who had suffered, after the cessation of the catamenia, from a profuse uterine discharge of a watery consistence. The exact nature of the case could not be determined during life; but after death, which occurred fifteen months after she applied for medical advice, the uterus was found enlarged, and both it and the Fallopian tubes and ovaries were filled with tuberculous masses. The lining membrane of the uterus was ulcerated. The other organs of the body were healthy, except the liver, which was enlarged and in a state of fatty degeneration. Dr. Oldham observed that he had seen at least six cases of uterine phthisis, which almost always seems to attack the cavity of the organ.

XXII. *On the Use of Wire Loops, Horseshoe Wires, &c., for Correcting Anteversion, Retroversion, Obliquities, and Prolapse of the Unimpregnated Uterus.* By Charles Clay, M.D. Manchester.—In this communication Dr. Clay condemns the instruments at present in use for rectifying displacements of the uterus, with the exception of his own spiral elastic-wire pessary, which he considers likely to prove beneficial in most cases. The objections to this instrument, however, are—its price, which varies from seven shillings to eight shillings, and the difficulty, in certain instances, of keeping the os uteri on the summit of the coil. Dr. Clay has therefore endeavoured to produce a cheaper and more efficient kind of instrument, which is of a very simple construction, consisting only of wire, formed either into a loop of a horseshoe form, or a double horseshoe form. In the case of anteversion, the loop of the instrument is placed over the cervix; in the case of retroversion, the horseshoe wire is employed; and in the case of prolapse, the double horseshoe wire is used to support the uterus. The external part, or stem of the instrument, is fixed to a bandage passed over the perinæum.

In the subsequent discussion, various speakers gave their opinions as to the employment of pessaries and supports in general, and as to the construction of those to be used in special cases; but Dr. Oldham advised, as the result of his experience, the rejection of all kinds of support except a well-arranged pad and bandage, and that only in very bad cases.

XXIII. *A Case of Face Presentation; Delivery by Forceps; Subsequent Sloughing or Separation of the Mucous Lining of the Bladder, and Expulsion of the same.* By W. Martyn, M.D., F.R.C.S.—The patient was in her fourth confinement, and her previous labours had been attended with much difficulty, apparently owing to a contracted state of the brim of the pelvis. In the present instance, after being twelve hours in labour, she was much exhausted, and the face of the child was presenting. The right ear could be felt above the pubis, and Dr. Martyn passed his finger readily round the head of the child. After drawing off the urine, he applied the forceps and brought away the child, which was dead. After the delivery the patient became very feverish and restless, and the urine constantly drained away; but she had passed it naturally only once since her confinement. The catheter was now employed, and about two quarts of bloody, very offensive, and *ammoniacal* urine were drawn off, and opium, milk, and brandy were administered. The urine was drawn off twice a day for a week, after which it passed of itself, but it was loaded with muco-purulent matter mixed with blood, and some days afterwards a portion of sloughed mucous membrane presented itself at the urethra, and was drawn away. Dr. Martyn refers to some other cases in which the lining membrane of the bladder appears to have sloughed away, and he attributes the circumstance to the long retention of the urine, owing to difficult labour, the ammoniacal condition of that fluid causing the sloughing of the mucous membrane.

XXIV. *Case of Ascites, with Ovarian Disease.* By Gustavus C. P. Murray, M.D.—The patient was a married woman, but had never been pregnant, and was twenty-eight years of age. On making an external examination, fluid was detected in the abdomen, and a solid mass just above the pubis. The os and cervix uteri were found quite healthy. After the administration of some diuretic medicine, which caused an increase in the flow of her urine, the patient was tapped, and thirty-three pints of fluid were withdrawn. She did not recover readily from the effects of the tapping, but under the use of appropriate remedies her condition seemed to improve sufficiently to justify the operation for the removal of the ovarian tumour, but violent peritonitis set in and she died. On the post-mortem examination a large multi-locular ovarian cyst of the left ovary, weighing six pounds, was found in the pelvis. On a close inspection of the ovarian cyst it was discovered that the trocar had pierced one of the upper and smaller cysts, and this circumstance might perhaps be connected with the subsequent attack of fatal peritonitis.

XXV. *Brief Account of Face Monstrosity.*—Mr. Sequira exhibited an anencephalous monster, of which he had lately delivered a patient.

Besides the absence of the brain, the fœtus had club-feet and club-hands, and six distinct fingers and toes on both sides. There was general shortening of the bones of the upper and lower extremities, and the genital organs were only partly developed. The mother had previously had three miscarriages, and five children born at the full time, one of the latter being a monstrosity, said to be still worse than that described by Mr. Sequira.

XXVI. *Case of Syphilis after Vaccination.* By Robert Druitt, M.R.C.P.—Dr. Druitt exhibited a drawing of a case of syphilis following vaccination. He saw the patient in one of the wards of the Lariboissière Hospital in Paris, and M. Chassaignac allowed him to have a drawing made in order that it might be exhibited to the profession in England. The patient was a male child, two years old, the second child of respectable parents, who, with the elder child, were said to be quite healthy. This child was also quite healthy until it was vaccinated, and three weeks after that operation three of the six vaccine vesicles were converted into indurated chancres, which were soon followed by secondary eruptions of the skin and anus. The eruption faded away under the influence of mercurial friction.

The President of the society stated that a case had come under his notice in which a lady had been infected with syphilis through vaccination, and two children vaccinated from the same child were unmistakably syphilized.

XXVII. *Note of a Case of Associated Hydrocephalus and Spina Bifida.* By William Leishman, M.D. Glasgow.—Dr. Leishman having observed the report of Case XIX. of the 'Transactions,' forwarded some notes of a similar case which came under his notice at the Glasgow Royal Infirmary. It was that of a female child nine months old, presenting both hydrocephalus and spina bifida. The upper cervical vertebræ were perfect, so that there was not a continuity of the spinal and cephalic enlargements, although they both depended on a common cause.

XXVIII. *Abortion produced by Tents of Common Sea-Tangle (Laminaria digitata).* By W. Edward Pritchard, M.D. Glasgow.—Dr. Pritchard being consulted by a female who had a contracted and distorted pelvis, and who was three months advanced in pregnancy, recommended the induction of abortion by means of a tent made of sea-tangle. The experiment was successful, and the ovum was expelled four days after the application. It should be mentioned that this person had been in peril of her life in a previous confinement, when the child was delivered piecemeal.

XXIX. *Diseased Cervix Uteri.*—Dr. Greenhalgh exhibited two morbid specimens which he had removed with Weiss's wire écraseur. The first was a specimen of epithelial cancer, and the second of simple hypertrophy of the neck of the womb.

XXX. *Notes of a Case of Chronic Hydrocephalus.* By HENRY M. MADGE, M.D.—The notes of this case extend over a period of about three years, the patient having been born in 1860. The mother had had six children, five of whom died of convulsions before they were a year old. The subject of the present case was born quite healthy and well developed, but about nine months after birth was seized with convulsions of a very violent character, which continued for several months, and subsequently ceased under the effects of treatment. But it was observed that the size of the head increased as the child grew, and the appearance presented, in fact, the characters of chronic hydrocephalus. At three and a half years of age the size of the head, although it had not diminished, had not increased, and therefore it was considered a satisfactory condition for the patient, who was tolerably intelligent and docile, but unable to walk or stand alone. Dr. Madge considers the case interesting in many points of view—as in the recovery from what appeared to be a bad attack of acute hydrocephalus; in the great size of the head; in the annihilation of all signs of intelligence at one period, and its re-appearance after a blank of several months. The treatment pursued was the administration of short courses of mercury, and the application of blisters to the nape of the neck and behind the ears, kept open for a very long time.

XXXI. *A Case of Stone in the Female Bladder. Vaginal Lithotomy.* By I. BAKER BROWN, F.R.C.S.—The patient was forty-four years of age, and the stone having been detected, it was removed by means of a scoop, after an incision had been made from the neck of the bladder, through the vagina, to within half an inch of the os uteri. The patient recovered without any bad symptoms.

XXXII. *On Combined External and Internal Version.* By J. BRAXTON HICKS, M.D., F.R.S.—In this paper Dr. Hicks, after pointing out the inconvenience often attending the ordinary mode of turning within the uterus, proceeds to describe the mode he has lately adopted of turning with both hands, one being placed outside and the other inside. The plan was first devised by Wigand, and it consists in the practice of manipulations which have for their object the rectification or alteration of the position of the fœtus so as to facilitate delivery, or to obviate the accidents which sometimes accompany parturition. Dr. Hicks describes at great length the different proceedings to be adopted in particular cases, and he recommends it in certain instances of placenta prævia, in many of convulsions, and in neck, shoulder, and transverse presentations, and their varieties. The most convenient time for turning the child is of course when the membranes are perfect; it is less so when the waters have partially escaped, but even when all the waters have been discharged there is some movement of the fœtus, and version may still be accomplished in some cases. Dr. Hicks then relates 20 cases in which he has employed the plan he describes. Eight of these were cases of placenta prævia; 1 was podalic version in accidental hæmorrhage, with head presentation; 1 podalic version in convulsions, with head presentation; 2 podalic version for coarctation of brim, with head presentation; 1 podalic version for prolapse of funis in head presentation; 1 podalic version in prolapse of funis, with arm presentation; 2 cephalic version in two cases of arm presentation; 4 of cephalic version changed to podalic in arm presentation.

XXXIII. *Three Cases of Retroversion of the Uterus.* By ROBERT HARDEY, M.R.C.S.—In two of these cases the results were favourable, but in the third there was retroversion of the uterus at the fourth month of pregnancy, with an ovarian tumour. The malposition was rectified, and delivery took place at the full time; but death ensued fourteen days afterwards, and it was found that a part of the intestine was strangulated by the ovarian tumour. Mr. Hardey, who has had much experience in obstetric practice, thinks that little benefit is to be expected from the intra-uterine use of mechanical contrivances in uterine malpositions, but he does not agree with those who assert that pessaries are prejudicial in prolapsus of the uterus and vagina. On the contrary, he has found their judicious application of the greatest advantage in some of these cases.

XXXIV. *Craniotomy Forceps.*—The instrument was exhibited and described by Dr. Barnes, who stated that it was an improvement upon the instruments of Professors Simpson and Murphy. One peculiarity was, that it had a powerful screw uniting the extremities of the handles and setting the blades fast at any required interval.

XXXV. *Case of Ovarian Dropsy, treated by Tapping and Pressure: Apparent Recovery for three and a half years: Return of Disease: Ovariotomy: Recovery.* By I. BAKER BROWN, F.R.C.S.—The patient was thirty years of age, and had been treated four years ago for unilocular ovarian dropsy by tapping and pressure; but as the disease returned, and she was in good general health, and no adhesions could be discovered, Mr. Brown performed the operation of ovariotomy, which was completely successful. This case showed that no adhesions had been produced by the previous tapping and pressure.

XXXVI. *Case of Extra-Uterine Fœtation, in which Two Fœtuses were found in connexion with the same Tube.* By N. J. HAYDON, M.D.—There was no medical evidence of the symptoms in this case during life, but on a post-mortem examination a large quantity of blood was found in the peritoneal cavity, and a fœtus, with its placenta and membranes, was loose in the pelvis. The uterus and appendages having been removed and examined by Dr. Tyler Smith and Dr. Braxton Hicks, these gentlemen reported that in their opinion there had been extra-uterine fœtation on two separate occasions; that the first fœtus had died about the second month of pregnancy, and the second had died at three months, and that three months afterwards the sac had burst and caused death. These opinions were supported by the appearances of the specimen, of which an engraving is given in the 'Transactions.'

XXXVII. *On a Case of Distension of the Uterus in a Fœtus impeding Labour.* Exhibited by Henry Gervis, M.D.—The fœtus was dead, and the birth was accomplished with great difficulty. The cause of the obstruction was found to be the great distension of the uterus of the fœtus, that organ being of a globular form, and containing about three-quarters of a pint of flaky serous fluid. There was no vagina, the uterus was divided into two cavities, and there were other abnormal conditions of the sexual apparatus.

XXXVIII. *Three Cases of Labour Obstructed by Abnormal Condition of the Fœtus, with some other points of interest.* By J. Braxton Hicks, M.D., F.R.S.—In the first of these cases there was ascites of the fœtus, and cystic distension of the pelvis of the kidneys from obstruction in both ureters; the abdomen of the fœtus was punctured, as it would not pass through the pelvis, and after the discharge of the fluid it was born by the natural efforts. In the second case there was enormous dilatation of the abdomen of the fœtus, in consequence of distension of the bladder, and, as in the last case, this circumstance offered an impediment to the delivery. On puncturing the abdomen of the fœtus, however, a quart of fluid escaped, and the child was quickly expelled. In the third case there was very great distension of the uterus of the mother, with dropsy of the amnion, and there was found to be a very large tumour on the fore part of the neck of the fœtus. In consequence of the sufferings of the patient, it was thought advisable to induce premature labour, and on the rupture of the membranes an enormous quantity of fluid escaped, and when labour set in, another bag, apparently of membranes, presented. This was, in fact, the tumour on the neck of the fœtus, and when it was punctured and the fluid allowed to escape, the labour was terminated by the natural efforts. The mother eventually did well.

XXXIX. *On Distension of the Bladder considered as a Cause of Post-partum Hæmorrhage.* By J. Lumley Earle, M.D., Obstetric Surgeon to the Queen's Hospital, Birmingham.—In this paper Dr. Earle shows that distension of the bladder may be one of the causes giving rise to post-partum hæmorrhage, although it has not been so described in any of the principal treatises on midwifery. He then explains how the distended bladder may act upon the uterus, causing displacement, and preventing it from contracting properly. Dr. Earle therefore insists upon the necessity of making a correct diagnosis in such cases, and of drawing off the urine, by which means all serious symptoms may sometimes be averted. Three cases are described in which the cause was ascertained, and the remedial measure was applied with success.

XL. *On Pertussis: its Causes, Symptoms, and Treatment.* By Richard Marley, M.R.C.S., L.A.C.—This paper is a general essay on hooping-cough, and reviews the principal points connected with the pathology and treatment of the disease. Chloroform, carefully employed, is commended when inspired during the paroxysm, and the use of belladonna is advocated in the second stage.

Review VI.

Su di un Caso di Triplice Vescica Urinaria. Memoria di Michele Scibelli, Professore nell' Ospedale degl' Incurabili, Socio Onorario della Reale Accademia Medico-Chirurgica di Napoli.—*Napoli*, Agosto, 1863.

Account of a Case of Triple Urinary Bladder. By Michael Scibelli, Professor at the Hospital of the "Incurabili," &c.—*Naples*, 1863. Translated from the Italian, with Remarks, by Dr. G. Mackenzie Bacon, Assistant-Physician Cambridgeshire County Asylum.

Among the anomalies of form presented by the bladder, which pathologists have recorded, the following deserves a place from its singularity, while it may have some additional interest as a contribution from a foreign land.

The case occurred in the practice of Sig. Scibelli, one of the Professors in the University of Naples, who has published an account of it, with drawings, under the title of 'Un Caso di Triplice Vescica,' and from this memoir, with which the writer met when in Naples early in the present year, the following history and particulars are derived. A simple recital of the facts will perhaps best introduce the case to our readers:

History.—G. S., of Naples, the son of healthy parents, had, when young, gonorrhœa, and afterwards syphilitic sores, which, however, were not followed by secondary symptoms. When about the age of fifty-seven, he had vesical pains and retention of urine—symptoms which were relieved by antiphlogistic means, but which returned at intervals of fifteen days to a month. A year later, in consequence of the aggravation of his sufferings, he came to the hospital. There was no need to use a catheter, as leeches to the anus and repeated cuppings sufficed to relieve the pains and make the urine flow; but about fifteen days after his admission, cerebral symptoms supervened, and speedily led to his death.

Post-mortem Examination.—A sound introduced into the bladder, passed freely, but made apparent a singular constriction of this cavity. An incision into the abdomen above the pubes brought into view a tumour full of fluid, which, with the sound as a guide, was cut down upon, and found to consist of the thickened walls of the bladder. Through the incision so made, a small quantity of urine escaped, and when this had run off, a larger quantity appeared, and then a third collection smaller than the first. On removing the parts, two openings were observed in the interior of the bladder (one larger than the other), to the right of and at its base, and communicating with two separate cavities, from which passed the ureters, which were much dilated. The vesical cavity was ovoïd and contracted, being only three inches in its greatest, and between two and three in its least diameter, and on its internal surface were seen folds and fibres more or less prominent, and also depressions of variable size. Of these holes, or apertures of communication, there were three, of large, middle, and small size. 1. The small one was in the centre of the lower wall of the bladder, at a distance of $1\frac{1}{4}$ inch from the orifice of the urethra, circular in form, allowing the passage of a large pencil, and was covered by mucous membrane, which was pushed forwards, constituting a small cyst, evidently an extra-parietal hernia of the mucous membrane. 2. The middle-sized one (fig. 1, B) was situated in the right lateral wall of the bladder, as if corresponding with the right angle of the vesical trigone, and was also circular. 3. The large one (fig. 1, A) was also in the same side of the bladder, about half an inch from the last one, and would admit the end of the little finger. These

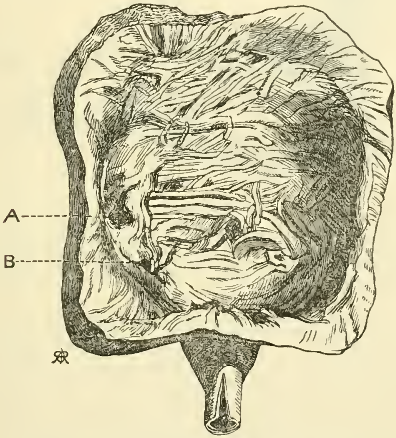

Fig. 1. Internal view of the bladder, showing the position of the two openings A and B, leading to the supplementary bladders. The dark spot in the centre marks the depression formed by the hernia of the mucous membrane. The muscular tissue is generally hypertrophied, and the walls of the bladder are much thickened.

two last openings led into two cavities continuous with the ureters. Eight minor depressions were noticed, evidently protrusions of the mucous membrane between the muscular fibres. On stripping off the mucous membrane, the muscular tissue appeared hypertrophied, and composed of numerous fasciculi varying in size and form, crossing in opposite directions, and interlacing with one another. Two larger openings to the right of the bladder have been alluded to, leading to two cavities communicating with the ureters. These cavities constituted two supplementary bladders.

THE SUPPLEMENTARY BLADDERS.—The first of these (fig. 2, C), continuous with what we have called the middle opening (fig. 1, B), by means of a small canal a quarter of an inch long, was of irregular ovoïd form, measuring $2\frac{1}{2}$ inches in its greatest, and $1\frac{1}{4}$ inch in its least diameter, was situated to the right of and parallel with the true bladder (fig. 2, B), and communicated with the right ureter, being covered by mucous membrane, under which the muscular fasciculi were very evident.

The other supplementary bladder (fig. 2, A), much larger and more

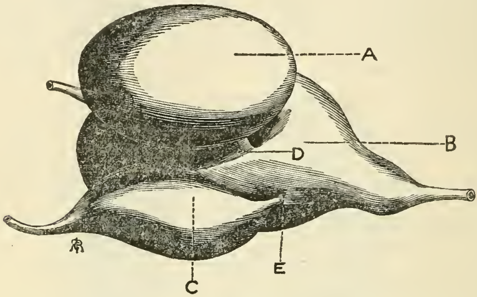

Fig. 2. External view, showing the relative position of the normal and supplementary bladders. B, the normal bladder (posterior surface); A and C, the supplementary bladders, with D and E, their respective points of entrance into B.

remarkable, communicated directly with the vesical cavity by means of the larger opening (fig. 1, A), was ovoïd in form, and resembled the physiological bladder. It was three inches long, and $2\frac{1}{4}$ inches broad, and situate to the right of and parallel with the true bladder, immediately under the smaller one just described: it communicated with the left ureter, and, besides the mucous covering, had a well-developed muscular tunic. Some cellular tissue united these two supplementary bladders to the true one.

Ureters and Kidneys.—The ureter on the right side, starting from the smaller supplementary bladder, ascended in a tortuous way to the kidney, describing in a course of nearly ten inches three different curves. Its calibre was by no means uniform throughout, being narrowest at the lower end (about $\frac{1}{4}$ inch in diameter), largest in the middle, and rather less at the upper extremity, where it would admit the tip of the little finger.

The right kidney was much distended, and its pelvis contained nearly two pints of purulent urine, while in the renal substance there were numerous distinct spots of suppuration, and it was softened throughout. There was no trace of supra-renal capsule on either kidney.

The left ureter, starting from the larger supplementary bladder—i.e., on the right side, above the body of the bladder—turned to the left, and pursued the usual direction. It was of uniform breadth, but had about its middle a reflection of the mucous membrane, forming a sort of perforated diaphragm across the canal. The left kidney was also enlarged, but not so much as the right, and contained seven ounces of purulent urine, mixed with calculous matter. It was also suppurating in places. The thoracic and cranial viscera were healthy; and the skin was of normal colour.

The Professor's comments on the case are as follow:

"We must first notice, that in spite of the absence of the supra-renal capsules, there was no bronzing of the skin, although it has been said that of all the alterations of the capsules, their atrophy and absence are the most likely to cause this disease. [*Query.*] But with regard to the chief point of interest—viz., the multiplicity of bladders—it is worthy of note that these cases are important not only in their pathology, but also in their diagnosis, as an erroneous view might be followed by very grave consequences. Notwithstanding, however, the cases given by Bonnet, Morgagni, and others, and the specimens to be found in the museums of the different cities of Europe, it is not yet settled whether multiple bladders really exist, and whether those believed to be such are the results of congenital malformation or acquired disease. It is the fact, says Vidal, that true double bladders are becoming more and more rare; indeed, the majority of cases so styled should be referred either to raised septa in a bladder, or to herniæ of the mucous membrane through the muscular fibres (*hernia tunicaria*), or to abscesses opening into the bladder, which remains large, and communicating with the cavity of the abscess. To this last category Professor de Rensis has called our attention, having reported a case of this nature believed to be multiple bladder. The class, then, of *herniæ tunicariæ* is that which furnishes the greater number of so-called multiple bladders; nor can the presence or absence of the muscular layer serve to distinguish these herniæ from multiple bladders, as Blandin and Cruveilhier have laid down, since minute dissections have shown in true *herniæ tunicariæ* a layer of muscular tissue, delicate but well marked. But there is another category of multiple bladders, different from the preceding, and referrible to a lesion of the lower end of the ureters, or of those points of the bladder at which the ureters enter; and to this, if we are not mistaken, our case should be referred, for, on attentive examination, it seems clear that the ends of the ureters have the greatest part in the origin of these supplementary bladders. But was this lesion quite accidental and acquired, depending on the hypertrophy of the bladder, so evidently itself secondary? We must confess that it is difficult to admit it, considering that the mouth of the left ureter was so far from the normal situation. Perhaps a congenital vice has favoured the development of this lesion, and confirmed it in adult age. As regards the lesions of the whole length of the ureters and kidneys, it is worthy of note that, though such changes are frequent as the result of obstructed micturition, in our case these lesions existed without any sensible obstacle to the passage of the urine. It is also remarkable that the bladder contained none of those calculous concretions so often formed under these conditions."

On reviewing the descriptions given above, there seems little doubt that the specimen referred to was a genuine instance of multiple bladder, uncommon as such cases are. That such a morbid condition is rare we may fairly infer from the absence of allusion to it in the leading works on pathology, as well as from the want of specimens in our hospital museums; but the question that presents itself as of greatest interest is as to the origin of this abnormality. Taking into consideration the appearances noted in this case, it would rather seem to be a congenital malformation than the consequence of acquired disease; and in support of this view the following facts may be adduced: that there is nothing in the normal bladder to account for the dilatation of the parts behind as a secondary result—no stricture of urethra, nor obstruction to the exit of the urine; and that there is positive evidence of a departure from the normal position of the parts in the unusual direction of the left ureter, both ureters entering the bladder close to one another, the left below, but on the same side as the right. The narrowed condition of one ureter might give some support to the idea that the so-called supplementary bladders were mere dilatations of the ureters; but it is clear that this would not be a sufficient explanation, inasmuch as only one of these canals was so affected, and this would not account for the double condition of bladder noticed. It is further clear that they could not be mere cysts, formed by protrusions of the mucous membrane between the weakened muscular columns, as each supplementary bladder was connected by cellular tissue with the true bladder, and entered it by a short but distinct canal, and was, moreover, provided with a muscular layer. The absence of symptoms, too, for so many years, would be against the supposition that these changes were the result of any chronic disease. It seems, then, most probable that these supplementary bladders originated in an error of development in fœtal life, in the causation of which the ends of the ureters may have played an important part, while the proximity of a viscus whose functions are ceaseless must have had some influence in the morbid changes in progress.

Review VII.

Lectures on the Diseases of Women. By C. West, M.D., F.R.C.P., &c. Third Edition.—*London,* 1864. pp. 687.

The appearance of a new edition of Dr. West's standard book 'On the Diseases of Women' cannot fail to be a matter of interest to those engaged in the study of uterine pathology. The members of our profession who have not yet read this work of our author have a pleasure in store; and those who, like ourselves, are already familiar with his writings, will find great enjoyment in the perusal of this last edition.

To us it is like conversing with an old friend who has come for awhile from that field in which he has been such a worthy and zealous labourer, to speak of his late toils in some new ground, and to tell us that matured reflection has compelled him on some points to modify his former views.

This treatise is one so familiar to most members of the medical profession, and has been already so fully reviewed in this as well as in other journals, that it would be quite superfluous on this occasion to do more than glance at any slight alterations which we may deem of interest. Our intention, therefore, is to confine our remarks almost exclusively to those novelties which may strike us.

We are glad to find that the two opening lectures, which are entirely of an introductory character, have remained unchanged, as we have always regarded them as a most attractive commencement to the work, and the sound advice contained in them cannot fail to be of value to the junior practitioner.

The three succeeding lectures treat very fully of the disorders of menstruation. In the one upon amenorrhœa we observe that the author makes no mention of the use of podophyllin as an emmenagogue, which in our hands has certainly often been administered with advantage. We do not assert that the drug has any certain specific action upon the uterus; most probably it has upon the rectum, and thus acts sympathetically, in the same way in which aloes and other cathartics do when the large intestine is much stimulated. In speaking of menorrhagia, Dr. West admits that he has altered his opinion as to the styptic property of the ergot of rye, and in this we entirely concur. He says (p. 58):

"I used to think that it was not possessed of any power of arresting hæmorrhage, independent of that which it exerts as an excitant of the muscular contractions of the womb. I hesitate now, however, to express that opinion so confidently as heretofore, since I have observed several instances in which bleeding has been staunched by its employment without any sensible uterine contraction having been produced."

He recommends the liquid extract of ergot, which is a new preparation.

On the practice of removing the mucous membrane of the uterus by the gouge in certain cases of menorrhagia, the author's views entirely coincide with those of M. Aran, who has apparently condemned it on very sound principles; and we hardly think that such a hazardous proceeding will have many supporters in this country. Dr. West has not in the least changed his views with regard to the treatment of mechanical dysmenorrhœa, and we must confess our conviction that he has at least somewhat underrated the *frequency* of this uterine disorder. Whether the practice of dividing the os and cervix in such cases, which is much in vogue at present among some accoucheurs, is a plan of treatment to be admired, is certainly very questionable; but that cases do occur occasionally which are benefited by incision or dilatation, we have little doubt.

Lectures IX. to XIII. are occupied with the consideration of misplacements of the uterus. With reference to the subject of prolapsus, Dr. West strongly objects to the view maintained by M. Huguier, "that prolapsus of the uterus is a condition that scarcely ever exists; but that cervical hypertrophy has been almost invariably mistaken for it, and that consequently not the support of the womb, but the removal of the elongated cervix, is the proceeding to which one ought to have recourse."

We may mention that Dr. M'Clintock of Dublin also condemns this opinion of the French author. He says, in his recent excellent work 'On the Diseases of Women:'—"I feel satisfied that the frequency of this cervical hypertrophy, and its influence on the production of the displacement, have been greatly over-estimated by M. Huguier and some others; and therefore the practice they recommend—viz., excision of the cervix uteri, if justifiable at all, should only be resorted to in a very few exceptional cases."

With regard to the various pessaries which have been made for the treatment of prolapsus, the ingenious one of Dr. Zwanck seems to have gained the greatest favour with Dr. West: he writes thus :—" I have now employed it on several occasions, and have been surprised to find how effectually it retains even the enlarged womb which has been frequently procident." And again: " Its small liability to misplacement is, as I have already stated, one of the great advantages of Zwanck's instrument." We are inclined to agree with Dr. M'Clintock, who in speaking of permanent cures which he has effected by means of the globe and disk pessaries, recommends that the size of the instrument should be from time to time reduced till its diameter about equals the normal diameter of the vagina, and can at last be safely dispensed with. Most operative procedures for the cure of prolapsus, except in certain cases, are condemned by Dr. West. In writing upon this subject, he remarks (p. 178):

"In those, for instance, where extensive laceration of the perinæum has been followed by prolapsus of the vagina or rectum, and by consequent descent of the uterus, it is obvious that all mechanical contrivances for keeping the womb in place will accomplish but little in comparison with what we may hope to do by restoring the perinæum, giving to the vagina once more its proper support, and bringing the parts again into their natural condition. Between this, however, and the artificial contraction of the orifice of the vulva, there is a very wide difference."

Simpson's "uterine supporter," in the treatment of flexions of the uterus, still continues to be justly censured by our author, as it is by many others in the profession. Hodge's lever pessary is favourably regarded in cases of retro-flexion and retro-version of the womb. The last lecture on the subject of misplacements of the uterus—namely, that which treats of the inversion of the organ—is very well written, and forms an admirable *résumé* of this subject.

We intend passing over the sections which concern uterine tumours and out-growths, as well as those relating to malignant diseases of the uterus, because, although most excellent and comprehensive in their character, they contain no material alteration from the last edition of this work. Dr. West himself tells us in the preface, that the chief additions will be found under the heads of Uterine Hæmatocele and Ovarian Disease; and it is these affections that we now propose to notice. With regard to the term *uterine* hæmatocele, which is the name used by our author in his twenty-third lecture, we would venture to express our opinion, that it would be perhaps more consistent with good nomenclature, as suggested by Dr. M'Clintock, to employ the designation *pelvic* hæmatocele, which simply implies an extravasation of blood in the pelvis, and to confine the term uterine hæmatocele to extravasation of blood into the substance of the uterus. Dr. West believes that, in the majority of instances, the blood is derived from the rupture of the congested ovary itself, or from the fimbriated extremity of the Fallopian tube of one or other side, and that a sac is then formed by inflammation having been set up around the effused blood. The author differs from Virchow in believing that the source of the blood is from the newly-formed vessels of false membranes produced by previous pelvic peritonitis.

Dr. West observes, "Even Virchow's theories ought to have some clear evidence to rest on. I know of none that would prove pelvic peritonitis to be an ordinary precursor of uterine hæmatocele." The subject of this chapter is very fully discussed in Dr. West's usually lucid and masterly manner.[1] All the fragmentary knowledge of this strange affection which we find dispersed in various works of obstetric writers, has been carefully strung together, and forms the best account of this malady which exists. We will now glance at some of the most interesting points connected with this lesion. It appears to occur almost invariably during the period of the greatest sexual vigour. It seems to stand but rarely in any direct relation to pregnancy or miscarriage. Most authors appear to admit that the time of occurrence of such special congestion is at the return of a menstrual period. Dr. West observes, that there is generally a certain family likeness in the history of these hæmorrhages. His description of the symptoms and course of this ailment is so excellent that we cannot do better than quote his own words (p. 448):

"After some disorder of the menstrual function, sometimes after its temporary suppression from cold, fatigue, or moral shock, severe abdominal pain comes on, referred usually to one or other iliac region. It is by no means constant for the menses to remain suppressed after the occurrence of this pain, which no doubt marks the outpouring of blood into the peritoneum, but usually they continue, though probably more scantily than in health; while now and then a profuse loss of blood takes place from the vagina, in spite of the evidence of internal hæmorrhage. The pain, though severe, is seldom intense, nor is the shock which accompanies it at all comparable to that extreme depression which indicates the occurrence of intestinal perforation, or the rupture of the sac of an extra-uterine fœtation. I cannot say how soon after the shock and pain a swelling is commonly perceptible in the abdomen, nor what proportion is borne to the other cases by those in which the swelling is entirely absent, though without doubt the latter are quite the minority. I have

[1] A very able thesis on 'Effusions of Blood in the Neighbourhood of the Uterus' has been written by Dr. Tuckwell, of Oxford, which we warmly recommend to those of our readers who are interested in this subject. Dr. Tuckwell believes that these extravasations of blood are almost always intra-peritoneal, although they are occasionally extra-peritoneal. He endeavours to show that the uterus, its appendages, and the blood-vessels in its immediate neighbourhood, constitute the source from whence these blood-tumours originate. He says it may occur in one of five ways:

"A. By obstruction to the natural outlet of the menstrual blood, which regurgitates into the peritoneal cavity either through the ostia abdominalia of the tubæ or through a rent in some part of their walls.

"B. By hæmorrhage into the Fallopian tube at the menstrual epoch and escape of the blood, either by the ostium abdominale or by rupture from over-distension.

"C. By rupture of the sac in extra-uterine fœtation, more especially in tubal pregnancy.

"D. By rupture of the investing tunic of a congested ovary, and escape of blood either from a Graafian vesicle, which is the seat of extraordinary hæmorrhage, or from the parenchyma of the organ into which a bloodvessel has burst.

"E. By rupture of a varicose vein in the pampiniform plexus of the ovary."

detected the swelling within forty-eight hours after the first symptom as a vaguely-defined hard lump in the iliac region, apparently of the bigness of the fist, not quite even, not moveable, tender on pressure, and feeling so similar to the swelling which is felt in cases of inflammation of the uterine appendages, that, apart from its history, one would be likely to make a mistake as to its real nature.

"Pain, exacerbated at uncertain intervals, as is all pain associated with uterine ailment, tenderness limited to the neighbourhood of the painful part, and general febrile disturbance, though usually not very severe, continue to be experienced, accompanied with difficult micturition, with pain and difficulty in defæcation, and generally with an increased pain on moving the leg of the affected side, or on attempting to assume the sitting posture. The febrile symptoms usually subside of their own accord, the pain also diminishes, a sense of weight in the pelvis, bearing down, difficult micturition and defæcation remaining behind, with difficulty and discomfort in walking, and lead by the discomfort which they occasion to a vaginal examination, and to the discovery of the pelvic tumour.

"This pelvic tumour differs much in its size, situation, and character; and in some cases where the symptoms point unequivocally to the existence of hæmatocele, no bulging of the vaginal wall has been present. For this occasional absence of the pelvic tumour I do not know how to account, though I think it is most frequent when the effusion has been extensive. The fact, at any rate, is of much importance to be borne in mind in order to avoid the errors in diagnosis which we should fall into if we regarded pelvic tumour as an invariable attendant on these hæmorrhages. Usually, indeed, the pelvic tumour is present, and closely resembles that observed in cases of inflammation of the uterine appendages. It is equally firm, seems to be equally intimately connected with the uterus, and has the same globular form, differing perhaps chiefly in this, that it produces a greater degree of displacement of the womb than is observed in a tumour of equal size due to inflammation in the vicinity of the organ. This circumstance is, I think, readily explicable by the rapidity with which blood is effused, as compared with the greater slowness with which the changes take place that are due to inflammatory action, and by which, moreover, the womb becomes fixed in its position, and therefore less liable to displacement. The changes that take place in the tumour do not seem to be governed by any unvarying law. It often becomes extremely firm, owing, no doubt, to the removal of the more fluid part of the blood; and it is in consequence of this change that a blood-swelling has occasionally been mistaken for a fibrous tumour. The supposed solid tumour, however, will be observed, if carefully watched, to diminish by degrees, and at length to disappear, leaving behind only a little thickening and resistance at the roof of the vagina; and if, as is commonly the case, a swelling also existed in the iliac region, that too will diminish at the same rate with the one felt per vaginam, or will even be removed with still greater rapidity. In other instances, the tumour having shrunk from the dimensions which it presented at first, will once more suddenly increase, such increase coinciding with a more or less distinct menstrual effort, often with actual menstruation; and in a doubtful case there is nothing more characteristic of its true nature than the sudden increase of the swelling coinciding with the menstrual period."

With reference to the termination of this disease, Dr. West considers that absorption of the blood is a very rare occurrence (p. 450):

"Of eight cases of which I have preserved a record, there was but one in which the tumour was removed by a process of simple absorption; and in this instance the swelling was limited to the right iliac region, and produced no bulging of the vaginal wall. In two cases a discharge of blood, partly fluid, partly coagulated, took place from the rectum; in a fourth, suppuration preceded its discharge, and blood-stained pus escaped by the rectum; and in a fifth, the sac burst into the peritoneum, and the patient died. In the three remaining cases the tumour was punctured by the vagina; and in the last of them the ailment was already chronic, and the blood-cyst had become an abscess long before the patient came under my care."

These eight cases, which are related in detail, are well worthy of perusal. The several conditions with which uterine, or as we would rather say *pelvic*, hæmatocele may be confounded, are given by Dr. West as follows—"Extra-uterine pregnancy, retroversion of the pregnant uterus, and inflammation of the cellular tissue between the uterus and rectum, and fibrous or ovarian tumours." The differential diagnosis which here follows is extremely well given. We should think that in some obscure cases the combined exploration of the index-finger in the rectum, and thumb in the vagina, would often prove a very valuable diagnostic test. This means of examination is not alluded to by the author, but its utility has been highly spoken of by Dr. Tilt, who calls it the "double touch;" it is also strongly recommended by Recamier.

The following tables which relate to the pathology and treatment of the affection which is being discussed, are, we think, too important to be omitted here (p. 463):

"Of 55 cases of uterine hæmatocele, treated on the expectant plan, 43 recovered, 12 died.

"Of the former,—

"The blood was absorbed in	30
" escaped by the rectum in	7
" " " vagina in	4
" " " uterus in	1
" " into cavity of peritoneum in	1
	43

"Of the 12 deaths,—

1	took place from	phthisis.
1	"	phthisis and albuminuria.
1	"	supervention of dysentery.
1	"	great debility and extensive abscess of the thigh.

And are therefore only indirectly due to the sanguineous effusion.

"Of the remaining 8,—

1	took place from	pyæmia after the tumour had burst per rectum.
1	"	hæmorrhage by the bowel.
2	"	hæmorrhage into the cyst.
1	"	" " " and per vaginam.
1	"	rupture into abdomen and peritonitis.
2	"	peritonitis without cyst-rupture, the inflammation being acute in the one case and chronic in the other.
8		

"Of 48 cases in which surgical interference was had recourse to, 40 recovered, 8 died.

"In 38 of the 40 recoveries, the puncture was made by the vagina. In 2 of the 40 recoveries, the puncture was made in the abdomen.

"Of the 8 deaths,—

1	took place from	peritonitis after puncture of the abdomen.
		In the other cases the puncture was made by the vagina.
1	,,	cyst-rupture after ineffectual puncture.
1	,,	pyæmia, symptoms of which had preceded the puncture.
1	,,	pyæmia following the puncture.
2	,,	hæmorrhage through the wound.
1	,,	hæmorrhage into the sac after closure of the punctured wound.
1	,,	peritonitis."
8		

Finally, with regard to treatment, Dr. West, in speaking of those cases in which the blood is effused in such abundance as to cause immediate danger, urges the employment of opium rather for its stimulant than its sedative properties; and looking to the inestimable value of this drug in all instances of internal rupture, we should be inclined to put much faith in its use.

We should imagine that the plan of treatment adopted by M. Aran, which consists of placing relays of leeches over the abdominal swelling, twenty to thirty in number, would be considered somewhat too heroic in this country, although coming from so high an authority, is thought by Dr. West to merit a trial. Concerning the expediency of surgical interference, and the question of puncture, the author sums up his own conclusions thus (p. 467):

"*Not to puncture the cyst*—

"1st. So long as the effusion is recent, and there is therefore reasonable prospect of its being absorbed.

"2nd. So long as the effusion, although of long standing, is in course of gradual, even though very slow diminution.

"3rd. Nor so long as the periodical increase of the effusion coinciding with the return of a menstrual epoch shows the cause which originally produced it to be still in operation.

"*I should puncture the cyst*—

"1st. When a long-standing effusion shows little or no disposition to become absorbed.

"2nd. When the occurrence of rigors and the supervention of hectic symptoms prove suppuration to have taken place; and in such circumstances I should puncture through the abdominal walls, provided the swelling were not readily accessible by the vagina."

The next point upon which we find a change in the author's views since the last edition of the work, is the question of ovariotomy. Seven chapters are devoted to the subject of ovarian disease generally, and the greatest care is manifested in their construction.

We are anxious to draw the particular attention of all those who are interested in gynækology to this portion of the present treatise. The reader becomes fully possessed of all the leading features and recent facts in connexion with this most important branch of pathology, which is at present exciting the interest of large numbers of the medical profession. It would be entirely out of place here to enter upon controversy. Much might be discussed upon the matter comprised in the lectures we have referred to: it is our wish, however, to adhere to the original intention of alluding only to those portions of the work which contain fresh material or modified views. With respect to the palliative treatment of ovarian dropsy, Dr. West makes some remarks concerning the estimation of the value of iodine injections, which we think advisable to quote (p. 583):

"It needs to be ascertained—

"1. How far these injections may be safely employed in cases of compound cysts, and what effect they have in retarding the development of the principal cyst? and whether the character of the fluid—as, for instance, its being pellucid, and but slightly viscid, indicates the use of the injection, even in cases of multilocular cysts?

"2. How far the caution suggested by Professor Simpson of never employing the injection after a first tapping diminishes its risk?

"3. Whether a watery solution of iodine, or one containing spirit, is the safer, and whether the employment of a large quantity of a weak solution, or of a small quantity of a strong solution, is attended by the greater hazard?

"4. What means afford the best guarantee against the escape of the injection into the abdominal cavity.

"5. How long it is expedient to allow the injection to remain in the cyst, and whether its complete removal by an exhausting syringe, on the principle of Bowditch's, furnishes an important safeguard against the occurrence of iodism, cyst-inflammation, or peritonitis?

"6. What relation subsists between the amount of pain at the time of the injection and the occurrence of dangerous peritonitis or cyst-inflammation afterwards; and consequently how far is pain to be taken as an indication for desisting from the injection?

"7. What are the best means for preventing or controlling dangerous symptoms after the injection?

"8. In the event of the failure of a first injection, what is to be expected from its repetition; and if repeated, is it desirable that the next tapping should be hastened, or that interference should be postponed until the patient's general condition indicates its necessity?"

Lastly, the observations made by the author about the great radical cure of ovarian dropsy—viz., the extirpation of the diseased organ—must be replete with interest to all those who, like ourselves, set such a high value on his experienced and sober judgment. The honest investigation which has led Dr. West to the careful reconsideration and ultimate modification of his former opinions is worthy of the greatest praise. The following extracts will give the reader the best idea of the last views held by the author (p. 603):

"I think, then, that we are now bound to admit ovariotomy as one of the legitimate operations of surgery, as holding out a prospect, and a daily brightening prospect, of escape from a painful and inevitable death, which at last, indeed, becomes welcome, only because the road that leads to it conducts the patient through such utter misery. Perhaps we may sum up the indications and contra-indications for the operations somewhat thus:

"1. It is *not* to be performed in any case of single cyst which is not increasing, or is increasing but slowly, while it has not as yet interfered with the patient's general health. In other words, life is not to be jeopardized for a mere discomfort.

"2. It is *not*, as a general rule, to be performed until after the cyst has been tapped once. The reasons for this caution are threefold: in some rare cases, the fluid does not re-collect; the amount of constitutional disturbance which follows tapping would be some index to the amount that might be apprehended from the more serious operation of extirpating the tumour; and lastly, when the cyst is emptied, and during the process of its refilling, its relations, and the presence or absence of adhesions, especially to parts within the pelvis, can be more readily ascertained. I doubt whether, in the case of simple cysts, ovariotomy ought not to be further limited to cases in which trial has been made of iodine injections sufficient to ascertain them to be inefficacious, or to prove them to be unsafe.

"3. It is *not* to be performed in any case in which a tumour is felt in the pelvis, retaining the same situation, but little changed after tapping, and from which, by means of the sound, the uterus cannot be distinctly isolated.

"4. It is further contra-indicated by the presence of albumen in the urine, or at any rate by the persistence of any trace of it after tapping, and also by the early occurrence of swelling of the legs, and by the presence of any considerable quantity of ascitic fluid in the abdominal cavity.

"5. And lastly, its success is rendered extremely doubtful by the previous occurrence of cyst-inflammation and general peritonitis, as evidenced by attacks of sickness, shivering, fever, and abdominal pain, and by the presence of pus in the fluid evacuated by puncture. The fact of a patient having had occasional attacks of abdominal pain, of short duration, unattended by fever or by abiding tenderness, does not contra-indicate the operation, since such attacks occur independently of inflammation.

"On the other hand, it is not contra-indicated—

"1. By the patient's youth or age, nor by the fact of her having previously undergone several tappings,nor by the irregularity or suppression of the menses, since complete menstrual suppression does not prove both ovaries to be implicated.

"2. It is justifiable and to be recommended, in all cases of ovarian tumour, whatever be its structure, and whether its existence be of long or short duration, and whether the tapping has or has not been frequently resorted to, where the disease is steadily and progressively increasing, and when the patient's health is beginning to suffer from this increase, but as far as can be ascertained, from no other cause independent of the local mischief.

"Something, indeed I think much, of our conduct must be governed by the state of the patient's own mind and wishes, by the calmness with which she can regard the possible failure of the operation, and the sudden entering on the unknown land; by the strength of the ties which bind her to the world, and make her desirous to continue in it, and by the spirit of hopefulness that may enable her to look beyond the risk of the few days to the perfect health in future years which will be the reward of a successful venture. Dread of the issue is a bad state of mind in which to undergo an operation of this magnitude; I am not sure but that indifference is even worse; I am quite certain that moral considerations must be weighed as carefully as those furnished by the character of the tumour or the history of its growth."

In Dr. West's last lecture—viz., that which treats of diseases of the external organs of generation—will be found a very good description of that singular neuralgic affection which was first described by Dr. Marion Sims, in a paper read by him before the Obstetrical Society, and which he has termed "Vaginismus." It constitutes an obstinate spasmodic condition of the orifice of the vulva. Dr. West does not agree with Dr. Churchill of Dublin in believing that vaginitis is a common attendant upon this peculiar state. After giving some good general rules of treatment, the gradual dilatation of the vagina is recommended by means of bougies and glass dilators.

Dr. West considers that it is rarely necessary to have recourse to

Dr. Sims' operation, which "consists in the excision of the remains of the hymen, the subsequent incision of the vaginal orifice, and the further enlargement of the canal by means of a dilator."

We are delighted to find a physician of such high standing as Dr. West at length boldly notice the subject of masturbation in the female, especially as he does so with the object of condemning an operation for its supposed cure, which has been called by its supporters "Clitorotomy" (*sic*). Although this operation has we believe, been countenanced, and even practised by a Northern professor, we think that it has only to be understood to be severely censured as being both unjustifiable and unphysiological. We are strongly of opinion, however, that the subject of masturbation in women has been far too long ignored by writers on their diseases. We therefore hail with satisfaction its mention in this edition. That the evil does exist, even to a large extent, is a fact too apparent to escape the observation of one at all versed in the maladies of women; that its baneful influence brings with it a host of evils, both moral and physical, is also certain; and we sincerely trust that the pathology of this loathsome habit will now engage the attention of superior practitioners, and be investigated in a truly scientific spirit.

We entirely endorse the sentiment expressed by Dr. West, where he says: "Our profession ought to be a noble one. The ring and the sword, in some universities of the Continent, still symbolize the knightly vows taken by the candidate for the doctor's degree; and it is in the spirit of chivalry alone that medicine can be safely practised."

In closing this interesting volume, and bidding farewell to the author for the present, we willingly embrace the opportunity of returning to him our grateful thanks for the vast amount of instruction he has afforded us. His valuable treatise needs no eulogy on our part. His graphic diction and truthful pictures of disease all speak for themselves. Unlike the numerous compilations which exist upon diseases of women, his esteemed work indicates at once vast practical experience with deep research, making it most attractive both to the practitioner and student. Writers on gynækology seem of late to have been endeavouring to outvie each other in their literary productions—foremost in the contest must appear the name of Dr. Charles West.

Review VIII.

Annual Reports of the English County Asylums for 1863.

The County lunatic asylums have once more contributed their yearly offering to the literature of the profession. Dropping in singly, slowly, and irregularly, the reports of these establishments mount by degrees into a goodly pile, and it is in this that we must search for almost the only information that reaches the outer world from this speciality. The motley group which the covers of these documents form when placed side by side might indeed not unfairly be taken to represent the character of their contents; for, alike in nothing but their dulness, they abound in a barren variety of topics which, somewhat after the fashion of the objects in a kaleidoscope, dance before the eyes for a few moments, but fail to leave any definite impression on the mind. The unsatisfactory nature of these reports, in a medical point of view, is no new theme, and has been the subject of remark before in this Review, but it cannot fail to be a matter of regret to the profession at large that the same ground for objection continues to exist. Within the last fifteen years the number of asylums in this country has been nearly doubled, and the splendid buildings in most of our counties proclaim what efforts have been made for the lunatic poor; but they assert no less positively how large a field of practice has been opened for the profession. The Act of 1853, which made medical men alone eligible as the Superintendents of asylums, may be said, indeed, to have placed under their cultivation a virgin soil; for, up to that time insanity was a subject barely recognised as belonging to the province of the physician, and lunatics were regarded more as prisoners than the victims of disease, coming under the notice of the medical man far oftener as the objects of pecuniary speculation than in any other light. The great increase of asylum accommodation in the last few years has thus called into existence quite a new race of medical men, whose professional duties are intermixed with much that appertained to the obsolete "governor" in the way of domestic management and so forth; and this circumstance has of itself considerably influenced the character and position of those holding such appointments. It may be desirable, for the proper management of these institutions, to place the supreme authority in the hands of the medical chief, making him responsible for patients, servants, farm, and works of every description; but the undoubted effect of combining with his other functions so much extraneous occupation has been to wean him from the more scientific ways of his art, leaving him more of an administrator and less of a physician; and this is abundantly illustrated by the nature of the reports before us, which deal so largely in economical details, and so little in questions of medical interest. We cannot easily imagine that the enumeration of such details as are presented in many of the accounts is of any great interest, even to the ratepayers for whose eyes they are prepared, nor that anybody can experience either pleasure or profit in being informed of such items as the following, which we noted recently in an expenditure of several thousands—viz., 1 strainer, 2*s.*; 1 sieve, 3*s.*; 2 iron ladles, 2*s.*; 4 *skeins of silk*, 4*d.*; 6*s.* 6*d.* for destroying rats, and 6*d.* for unpaid letters: but if this be needful, there can be no reason for dwarfing the medical researches, nor confining them merely to the stereotyped tables, many of which are of very dubious interest or utility.

At the present time there are thirty-eight county and four borough asylums in England; and by the last returns the number of lunatics in these houses was 21,551, the total of those confined in public and private asylums being 28,285.

We turn, then, to these Reports to glean what information we can from this extensive field, and to ascertain, if possible, what advances have been made in treatment and pathological knowledge. Of late years, since the abolition of restraint, the treatment has in all essential points been so little varied that it demands no particular comment; and we find scarce any reference to it in the annual reports, except in that of Dr. Lockhart Robertson, who is a great advocate of the Roman, or, more familiarly speaking, Turkish bath. He has used it in many instances at Hayward's Heath, and finds it very efficacious in cases of melancholia with refusal of food, while he has had several examples of its curative effects in cases of early phthisis. He illustrates his views by detailing a case of insanity complicated with albuminuria, where recovery seemed clearly due to the use of the bath. The Roman bath is evidently a great hobby of the Sussex superintendent, who, in concluding his remarks on it, gives the reins to his imagination in the following speculation: "If anything ever can cure hydrophobia, I believe it will be the Roman bath at 200°, continued for many hours!"

With a view to show the ordinary results of treatment, we have arranged in the following table a comparative statement of the cures and deaths in a dozen or more of the chief county asylums, further distinguishing the deaths in the two sexes, in order to illustrate the well-known fact of the greater relative mortality of men as compared with women in asylums. In accordance with the general custom in dealing with asylum statistics, the recoveries have been estimated on the number of those *admitted,* while the deaths are calculated on the total under treatment during the year:

TABLE I.—*Per-centages of*

Asylum.	Recoveries.	Deaths. Total.	Deaths. Male.	Deaths. Female.	Average No. resident.
Lincoln	27·6	8·87	11·49	5·42	438
Sussex	38·5	7·35	9·24	5·35	491
Stafford	56·63	12·53	14·09	10·76	483
Devon	42·	9·1	11·47	7·33	662
Kent	39·11	11·96	15·40	9·10	685
Wilts	37·	10·80	13·79	8·80	384
Somerset	54·	6·42	8·36	4·71	488
Essex	48·	7·98	8·75	7·42	508
Cambridgeshire	41·7	8·7	8·33	9·04	278
Rainhill (Lancashire)	41·04	8·32	9·01	7·55	666
Surrey	37·	5·5	7·61	3·81	915
Colney Hatch	31·18	7·56	10·94	5·16	1889
Hanwell	28·94	7·62	10·30	6·	1559
Bethlem[1]	55·08	4·30	4·23	4·34	142
St. Luke's[1]	58·65	8·7	8·33	9·04	158

There are, of course, special circumstances which may affect the value of these, as of all statistics, in particular instances; but from the number included in the list, the above table will be found a very fair sample of the results in public asylums, and the success obtained is sufficiently encouraging. The mortality in these establishments is liable to certain influences to which no other hospitals are subject, and

[1] Curable class only in both.

this fact makes the study of the death tables of great interest. The purely mental diseases for which the patients may be supposed to be admitted furnish but a small proportion of the total deaths, and a fatal result in such is felt more or less as an opprobrium and an evidence of unsuccessful treatment; but the special diseases of the nervous system which prove so fatal in asylums are to be found under the heads of general paralysis and epilepsy, and it is to the greater frequency of the former disease in men that we must look for a satisfactory solution of the relatively higher mortality in the male sex. We have in the following table collected from a few asylums, the form of whose statistics admits the possibility of such a comparison, the deaths attributable to five main causes—viz., chest disease, brain disease (i.e., structural disease not peculiar to the insane), epilepsy, general paralysis, and exhaustion from acute mental disease, and it will thus be seen at a glance what proportion each category contributes to the total mortality:

TABLE II.—*Causes of Death.*

<table>
<tr><th>Asylum.</th><th>Brain disease.</th><th>Epilepsy.</th><th>Chest disease.</th><th>General paralysis.</th><th>Acute mania or melancholia.</th><th>Total No. of deaths.</th></tr>
<tr><td>Devon</td><td>3</td><td>5</td><td>28</td><td>12 M.
6 F.</td><td>4</td><td>77</td></tr>
<tr><td>Rainhill</td><td>2</td><td>6</td><td>21</td><td>21 M.
4 F.</td><td>2</td><td>85</td></tr>
<tr><td>Stafford</td><td>17</td><td>11</td><td>8</td><td>15 M.
6 F.</td><td>13</td><td>87</td></tr>
<tr><td>Cambridgeshire</td><td>3</td><td>5</td><td>6</td><td>6 M.</td><td>4</td><td>31</td></tr>
<tr><td>Sussex</td><td>4</td><td>4</td><td>10</td><td>8 M.</td><td>4</td><td>43</td></tr>
<tr><td>Wilts</td><td>20</td><td>1</td><td>21</td><td>1 M.
1 F.</td><td>3</td><td>53</td></tr>
<tr><td>Lincoln</td><td>15</td><td>1</td><td>12</td><td>9 M.</td><td>1</td><td>48</td></tr>
<tr><td>Colney Hatch</td><td>—</td><td>22</td><td>38</td><td>43 M.
14 F.</td><td>19</td><td>173</td></tr>
<tr><td>Hanwell</td><td>15</td><td>8</td><td>23</td><td>21 M.
14 F.</td><td>8</td><td>147</td></tr>
<tr><td>Kent</td><td colspan="2">32</td><td>24</td><td>17 M.
6 F.</td><td>16</td><td>108</td></tr>
</table>

The above table shows how largely the yearly list of deaths is influenced by one disease, general paralysis. Thus, at the Devon Asylum it was the cause of about one-fourth of the total number, and at Colney Hatch of one-third, while Dr. Biggs states that at the Surrey nearly two-thirds of the deaths were due to this cause; and it is further noticeable how much more prevalent is this malady in the large towns or centres of manufacturing industry than in the rural population: witness the difference between the numbers at the Middlesex and at the Lincoln or Wilts Asylums.

In looking through these Reports, we have noticed the following cases as presenting some points of interest as regards their pathology.

At the Devon Asylum a man committed suicide in this way: having secreted a knife, he went to the closet, where he inflicted four slight wounds on the front and sides of the neck; but as the trachea and great vessels were uninjured, there seemed every chance of a favourable recovery. The patient was subsequently "much agitated and dejected in mind in consequence of the attempt made at self-destruction, and this agitation continued until his death," which occurred on the fifth day after the accident, from tetanus. Dr. Saunders considers "that the lock-jaw arose in this case not so much from the nature of the wounds inflicted as from the peculiar nervous excitement of the patient." In another instance (at Somerset) a woman cut her throat and died a month afterwards from spinal myelitis. She was attended at her home for a fortnight and then brought to the asylum, where she was fed daily by a tube in consequence of her inability to swallow, and after two weeks died unexpectedly. The wound was extensive, severing the trachea and penetrating the gullet back to the spine itself, the injury to which appeared to be the cause of death, as she had intense inflammation of the spinal marrow, which was covered throughout with recent lymph and pus. At the time of her death "the wound had half closed, she had gained in flesh, made not the slightest complaint of pain, sat up in bed, and there was no suspicion of the serious mischief going on in the spine."[1]

Dr. Boyd, of Somerset, is honourably distinguished among his *confrères* by the care and trouble he devotes to his reports; and he has contributed at various times some very useful statistics. We notice this year a table which establishes very clearly the correctness of the point so often insisted on by alienist physicians—viz., that the prospect of cure greatly depends on the patient being early brought under treatment: thus, of those admitted under one month from the commencement of the attack, 34 per cent. recovered; under two months, 33 per cent.; under three months, 22; and under four, only 10 per cent. Dr. Boyd also shows that the period of life most prone to insanity in males is later than in females, most males being admitted between forty and fifty years of age, and most females between thirty and forty-five.

At the Wilts Asylum, Dr. Thurnam records a very unusual form of death—viz., a spontaneous rupture of the spleen. A man aged twenty-three, imbecile and of very lymphatic habit, died after six hours' illness from syncope, which appeared to yield to the usual remedies. At the post-mortem, the "spleen was found of immense size, weighing four pounds avoirdupois; and on its anterior margin was a fissure two inches in length, through which hæmorrhage to a large extent had taken place. The exciting cause of the rupture appears to have been mental emotion, of the character of groundless fear." In connexion with this case, Dr. Thurnam makes some interesting remarks on the weight of the spleen in the insane, among whom it appears that this organ is found of less size than with those of more fortunate mental development. He gives as the result of fifty observations, twenty-five of each sex, 4·7 oz. as the average weight of the spleen in the male, and 4·6 oz. in the female, as noticed in the asylum; and comparing these with fifty-eight observations (thirty-nine of men

[1] The details of this case were, by Dr. Boyd's permission, related to the Pathological Society of London by Dr. Ogle, and will be found described in Vol. XV. of the Transactions.

and nineteen of women) made by Dr. Peacock among the (sane) patients of the Edinburgh Royal Infirmary,

"It appears that the average weight of the spleen in these fifty-eight cases exceeded by one-half that in the fifty insane persons, in whom the average weight was about $4\frac{1}{2}$ oz.; whilst that in the Edinburgh cases was 7 oz. It is further remarkable, that out of the fifty-eight Edinburgh cases there were only four in which the spleen weighed less than 3 oz.; whilst out of the fifty asylum cases as many as ten were of this unusually small weight. The average weight of this organ appears to be greater in the young than the aged, and part of the difference to be observed in the two series seems due to the greater proportion of aged persons in the deaths at the asylum. The results here obtained are in the main confirmed by the colossal tables of Dr. Boyd, in the 'Philosophical Transactions for 1861.' These give about $4\frac{1}{4}$ oz. as the average weight of the spleen in the insane at the Somerset Asylum, but only $5\frac{1}{4}$ oz. as the weight in patients at the Marylebone Infirmary . . . . Out of the 2600 cases tabulated by Dr. Boyd, the heaviest spleen weighed by him seems to have been one of 36 oz."

As a contrast to the above observations, we have extracted from the Kent report the following remarks, which may be said to illustrate the subject of apoplexy from quite a new point of view:

"In one instance death resulted from *apoplexy*, and a verdict was returned to this effect: the attack was brought on by obstruction to the breathing, caused by the man's having stuffed the corner of the sheet into his mouth. He had a delusion that snakes were in his stomach, and he was constantly trying to extract them with anything he could get hold of; and he had, doubtless, put the sheet in his mouth with this intention, certainly not from any suicidal tendency."

The ordinary subjects of remark in the reports are of but little interest to the profession in general; but the Suffolk Asylum deserves a passing allusion. It labours under the disagreeable singularity of having no gas; and the amusing laments of Dr. Kirkman thereon are, we feel, entitled to some sympathy. He observes:

"The sanitary value of increased light is very great; gloominess of mind is the unavoidable result of gloominess of atmosphere. Patients have always been observed to take great interest in gas, and to feel strongly and sensitively the *superiority* of the home of restoration, in this respect, to the home where disorders commenced amidst privations and trials, typified by one dim, heavy struggle of a penny flame, as much as by empty plates and tattered garments!"

There is one other matter that deserves mention—viz., the episode of the chaplain's report. Nothing, perhaps, marks the advance in the treatment of the insane more than their admission to the ordinary religious services, and nothing has done more to abolish the harsh distinctions so often drawn between those within and those without the asylum boundary. The silent power of old habit or custom will often of itself suffice to awe a madman into quiet in chapel, and call forth an obedience not easily rendered to other means; and for this reason among others, a crazy congregation is often just as orderly as any other—indeed, according to some accounts, the lunatics set a better example, for the Rev. G. W. Davies remarks: "that *from the absence of all sleepiness,* the behaviour of patients in chapel contrasts most favourably with that which I have witnessed in some congregations!" Doubtless, the many excellent men who minister in asylums fulfil their duties in the most conscientious manner, and they must be surrounded with many difficulties; but it is difficult to read some of their reports without a smile. One reverend gentleman points out "as an instructive incident, that sometimes when I enter the reading-desk, a patient may be annoyed with some one, and be using violent language; but more frequently than not, such patients, directly the service commences, respond as it were *instinctively to the solemnity of the occasion, and become quite devotional in their conduct.*" It rather spoils the sentiment of the last idea, however, to read in the next sentence such a common-sense explanation of the change in the patients' conduct as the following: "Perhaps the knowledge that they will be removed, and possibly kept for a time from attending chapel if they do not desist (for it does not do to overlook misbehaviour), may have also something to do in quieting them."

The chaplain of the Surrey Asylum reports to his committee:

"It is most encouraging to myself, and will doubtless be most gratifying to you to be assured, that the beneficial effects of the regular ministrations of the Gospel of our Lord Jesus Christ are manifestly seen in the improved Christian temper and spirit that for the most part pervades those patients who are constant attendants on the various means of grace."

We fear we cannot always attribute the quietism amongst asylum patients to thoughtfulness, for experience teaches us that the most "constant attendants" on the religious services are the demented, inert, and feeble-minded, many of whom follow the routine almost instinctively, and whose ideas are very few and far between, and that the bulk of the chapel-goers are the chronic cases, who give no trouble and go as a matter of course.

In many instances the chaplains, as at Rainhill, content themselves with some short and sensible remarks, and we cannot but think that such men would be found to exercise a more healthy and useful influence among patients than those who delight to set forth such ill-judged recitals as those that illustrate the reports of the Surrey and Hanwell asylums.

We have, in the foregoing pages, endeavoured to present a fair picture of the condition and operations of the public asylums, but the chief difficulty in pursuing this object has been one for which these establishments are alone responsible—viz., the want of any uniformity in their statistics. The value of any statistical inquiries depends greatly on the extent of the field in which they can be conducted, and by the present method any comparison of the results in different asylums is almost impracticable, each superintendent following the bent of his own fancy as to what details he gives, while some, as at the North and East Riding, give none at all. This is much to be regretted, and while it continues must limit the interest or value of asylum reports to their own neighbourhood, instead of being the means of effecting a *rapprochement* between this specialty and the profession generally.

Review IX.

Abstract of Medical and Physiological Papers published in Vols. XI. and XII. of the Proceedings of the Royal Society. From November 1860 to September 1863, inclusive.

I. *On the Relation between Muscular Irritability, Cadaveric Rigidity, and Putrefaction.* Croonian Lecture. By Brown-Séquard, M.D. vol. xi. p. 204.—The author's researches, which have been carried on since the year 1849, enable him to establish the following law—"that the greater the degree of muscular irritability at the time of death, the later is the appearance of cadaveric rigidity and the longer its duration; the later also is the commencement of putrefaction, and the slower its progress, and *vice versâ*." This is proved by various experiments: *a.* By dividing the roots of the sciatic nerve on one side, in dogs, and killing the animals at different periods after the operation, he ascertains that *paralysis* in its early stages increases, in its later stages (after one month from the first commencement) diminishes muscular irritability. Hence, in cases of recent paralysis of one extremity, cadaveric rigidity comes on later, lasts longer, and is followed at a later period by putrefaction in the diseased than in the healthy limb; while the contrary holds good in chronic cases. *b.* The lower the *temperature* of the muscles at the time of death, the longer is the duration of muscular irritability (as ascertained by galvanism), and the longer are cadaveric rigidity and putrefaction postponed. *c.* The law is further corroborated by the effects of *galvanism.* The more powerful the current passed through the muscles at the time of death, the shorter was the duration of muscular irritability; and in all cases the commencement of post-mortem rigidity and putrefaction was hastened in proportion to the strength of the current. Thus is explained the statement made by John Hunter—that there is no post-mortem rigidity in animals killed by lightning: the fact being that the rigidity may be so slight and transient as to be inappreciable. *d.* The effect of *prolonged muscular exercise* proves the same. From the exhaustion of the muscles, their irritability is soon extinguished. In overdriven cattle, animals hunted to death, and soldiers killed after a long fight, rigidity is early and short-lived, and putrefaction soon begins. *e.* The better *nourished* the muscles at the time of death, the more irritable are they. The influence of this is well seen in contrasting the post-mortem condition of the muscles in cases of sudden death (as decapitation) with their condition after death from chronic disease. *f. Convulsions* necessarily exhaust the muscles, and diminish muscular irritability. In death from tetanus, cadaveric rigidity has been seen to follow so quickly that it seemed to be but a continuation of the spasm of tetanus, without any interval of relaxation. *Poisons* which cause convulsions (e.g. strychnia) give rise to the same results in consequence of the convulsions which they produce.

II. *On the Cutaneous Sensibility of the Hand and Foot in different parts of the Surface, as tested by the Continuous Galvanic Current.* By H. Lobb, Esq. p. 356.—A sixty-element Pulvermacher's bath battery is excited with vinegar, and suspended free in the air by a piece of cord. Conducting wires are attached to its terminal hooks. To the positive wire a moistened sponge conductor is fastened, which is tied round the neck, so that the sponge may rest on the skin over the cervical vertebræ. To the negative wire a smooth metal conductor is attached. This conductor, placed on the back of the hand or arm, produces an unbearable burning sensation; whereas, on the palm of the hand, or under surface of the fingers, no pain whatever is experienced. Further, the skin on the back of the first phalanges and part of the second is insensible to the continuous current. The same holds good exactly in the foot. The smooth papillary skin of the palm and sole seems to be quite insensible to the continuous current.

III. *Remarks upon the most Correct Methods of Inquiry in reference to Pulsation, Respiration, Urinary products, Weight of the Body, and Food.* By E. Smith, M.D. p. 561.—In all inquiries of the kind, in order to arrive at a correct determination of the daily quantity of the products excreted, the whole of the excreta in the twenty-four hours must be taken for examination. The great variation in the quantities excreted at different periods of the day renders this necessary. *Pulsation.*—The pulse is to be counted regularly and often during the twenty-four hours, for never less than one minute, and for two, if possible: the sitting posture being taken at least five minutes, and, if previous exertion has been made, fifteen minutes before investigation. *Respiration* should also be counted, half a one being recorded. In comparing the rates of different days, the inquiry should be made at the same hour and the same period after meals; the person should be prepared by previous training to abstract the attention and breathe naturally. In estimating the quantity of air inspired, a mask, which covers so closely the mouth and nose as to prevent the ingress and egress of air at the sides, is fitted to the face. To estimate the quantity of carbonic acid expired, the expired acid is made to pass over a solution of caustic potash (sp. gr. 1.270) contained in a gutta-percha apparatus constructed so as to offer a large absorbing surface. The carbonic acid absorbed is calculated by weighing the apparatus before and after expiration. Here, too, a mask is employed, which must be only just large enough to contain the features: otherwise, expired air will collect in it and be re-inspired. *Urinary water.*—The whole of the urine passed daily must be collected and examined repeatedly in the twenty-four hours. The inquiry must be continued throughout the whole year. The analysis is not to be deferred later than two days after the urine is passed in warm weather, or later than four days in cold. The urine should be collected in tall and narrow glasses, which can be used during defæcation, which are graduated to one-tenth of an inch, and covered to prevent evaporation. For the determination of *Urea*, Liebig's volumetric method of analysis is employed. *Weight.*—The person should be weighed as nearly as possible at the same hour every morning, naked, after passing urine, and before taking food. *Food.*—One of two points may here be considered: either the general effect of the ordinary dietary, or the effect of separate articles of food; in the latter case, the food in question must be taken alone.

IV. *On the Elimination of Urea and Urinary Water in their Relation to the Period of the Day, Season, Exertion, Food, and other Influences acting on the Cycle of the Year.* By the same Author. p. 214.—A long notice of the author's views on the influence of cyclical changes on the body is contained in the 'Medico-Chirurgical Review,' vol. xxix. p. 435.

Two papers by Dr. Pavy—*Contributions to the Physiology of the Liver: Influence of Alkalies,* p. 90; *Influence of Acids in producing Saccharine Urine,* p. 335—have been already noticed in this Review, vol. xxviii. p. 243, and vol. xxx. p. 237. Besides these notices, a full account of that author's views on the subject of diabetes, &c., will be found in vol. xxx. p. 351.

V. *Experiments and Observations on the Structure and Function of the Stomach in the Vertebrate Class.* By W. Brinton, M.D. p. 357.—A more elaborate paper on the same subject has been published in this Review, vol. xxx. p. 189.

VI. *Experimental Researches on the Functions of the Vagus and Cervical Sympathetic Nerves in Man.* By A. Waller, M.D. p. 302.—An abstract of this will be found in the Review, vol. xxx. p. 240.

VII. *On the Effect of Temperature on the Secretion of Urea, as observed on a Voyage to China and at Hong Kong.* By Emil Becher, M.D. Vol. xii., p. 440.—The results of the experiments performed on himself by Becher during a period of 163 days are especially interesting, as showing the effect of a very high temperature on the quantity of urea excreted. He has found that there is a constant increase in the quantity excreted, as the temperature rises from 50° to 70°; but that above 70°, from 70° to 90°, there is an equally constant decrease.

VIII. *On the Amyloïd Substance of the Liver, and its ultimate Destination in the Animal Economy.* By R. M'Donnell, M.D. p. 476.—Starting with the assumption that Dr. Pavy's views are correct,[1] and that the amyloïd substance of the liver is not converted into sugar, the writer of this paper hazards a theory to account for *what becomes of the amyloïd, and what ulterior purposes it serves in the body.* If Lehmann and Brown-Séquard are correct, as he believes they are, in the assertion that the fibrine and much of the albumen of the portal blood are disintegrated in the liver, which, while it breaks up these azotized compounds, forms its own non-azotized amyloïd, and at the same time secretes bile containing merely a trace of nitrogen, the question naturally arises as to what becomes of the nitrogen thus liberated. M'Donnell believes that the amyloïd enters into combination with the nitrogen thus set free, and becomes an important nitrogenous substance, passing from a lower to a higher and more complex condition. What led him to this belief

[1] Cf. Med.-Chir. Rev., vol. xxx. p. 358.

was the discovery by Rouget and Bernard of the large quantity of amyloïd met with in the placenta and amnion of some animals, but still more of the abundance of the same substance in nearly all the tissues of the fœtus. Hence, he asks, may not the liver do for the adult what divers tissues do for the fœtus during its development? May not the liver form, with the help of the amyloïd secreted in its cells, a nitrogenous compound, just as the muscles of the fœtus convert the amyloïd substance contained in them into the highly-nitrogenous components of the muscular tissue?

What the newly-formed substance may be—whether it be albumen, albuminose, or caseine—does not seem to be determined. All that is known is, that the blood of the hepatic vein contains, more abundantly than other blood, an azotized compound.

IX. *On the Coagulation of the Blood.* Croonian Lecture, by J. Lister, F.R.S. p. 580.—Of the various theories, mechanical, chemical, and vital, that have been put forth and supported by different physiologists at, different times, to account for the phenomenon of the coagulation of the blood, first one and then another has held sway, till finally the writers and teachers of the present time, dissatisfied with any one explanation given, are compelled to write and to speak of many causes, all of which assist coagulation, but not one of which is alone capable of producing it under all circumstances. The theory which, some years ago, was received by many in this country—the ammonia theory—is shown by the experiments of Lister—first performed some years ago,[1] and repeated in this Lecture—to be fallacious. There is no doubt that ammonia added to blood will retard or prevent coagulation; but there is great doubt whether coagulation is due to spontaneous evolution of ammonia already present in the blood. Another theory, which, in common with that of Thackrah, must be called vital, and which holds "*that the influence of the living heart and vessels is the source of the blood's fluidity, and its loss the cause of coagulation,*" was propounded in a very able paper in this Review, in the year 1857,[2] by one of the first of living physiologists, Brücke of Vienna, and has always seemed to us to be nearer to the truth than any previous one. Setting aside, then, the ammonia theory as untenable, we propose to discuss the doctrines of Brücke and Lister respectively. Lister holds *that the real cause of the coagulation of the blood shed from the body is the influence exerted on it by ordinary matter, the contact of which, momentary though it may be, effects a change in the blood, inducing a mutual reaction between its solid and fluid constituents, in which the corpuscles impart to the liquor sanguinis a disposition to coagulate: that coagulation in the bloodvessels after death depends on the death of the vessels, which are no longer indifferent to the blood, as they are during life, but act on the blood like any other foreign substance.*

Both, therefore, hold that the blood-vessels are concerned with the fluid condition of the blood during life, and its change to a solid form after death; but by the one they are regarded as active instruments

[1] Cf. Med.-Chir. Rev., vol. xxvi. p. 234. [2] Cf. vol. xix. p. 183.

during life, as passive after death; by the other exactly the reverse. Brucke, in one part of his paper, suggests as possible the very doctrine which Lister has espoused and defended. He says: "Would it not be better to say at once that the contact of all bodies induces coagulation of the blood, except only the inside of living vessels, which is so indifferent to the blood as not to do so?" But then he answers in the negative: "The walls of the blood-vessels are not indifferent to the blood, but counteract its tendency to coagulate by a peculiar virtue inherent in them." He allows that the contact of foreign bodies promotes coagulation; but, he says, "in blood drawn from living vessels, coagulation proceeds from the foreign body (sides of basin, &c.) through the whole mass; whereas a foreign body introduced into living vessels produces only a local clot, the remainder of the blood continuing fluid." This objection is at once answered by Lister. He maintains that all parts of the blood do come into contact with the sides of a basin during the passage of the blood into it, and that the slightest and most momentary contact of any particle of the blood with the basin is sufficient. Further, that if great care be taken to prevent any such contact, the clot is limited. If the jugular vein of an ox be divided, and a cylindrical tube, open at both ends, be slipped down into the distal end of the vein, so as to fill it accurately, and be left there, some hours later a clot will have formed in the tube, but it will be tubular—i.e., that part of the blood only which is in contact with the tube will have clotted, the inner part, which has not touched the tube, remaining fluid. The fact that if a needle be introduced through the wall of a blood-vessel into the current of the circulating blood, and be left there, the blood coagulates round the needle wherever it comes in contact with it, seems to us to militate strongly against Brücke's theory, and to strengthen materially the theory of Lister. If Brücke were right, should not the virtue of the living vessels have power to prevent the clot from forming? For it forms round and about the needle, not at the part where the vessel is injured and may be supposed to have lost its virtue. Regarding the contact of foreign substances as the *primum agens*, Lister requires a second power—*the blood-corpuscles.* Liquor sanguinis, like the fluid of hydrocele, cannot of itself coagulate, even if an ordinary solid be introduced into it, unless blood-corpuscles be also added. (Schmidt, of Dorpat, attributes this agency, not to the corpuscles themselves as corpuscles, but to a chemical substance contained in them, which can be extracted from them, and which, in common with certain other substances in the body —e.g., the aqueous humour — possesses this remarkable property.) Lister has tried other substances in a finely-divided state, and finds that none except blood produces the effect.

X. *On the Immunity enjoyed by the Stomach from being Digested by its own Secretion during Life.* By F. W. Pavy, M.D., pp. 386, 559.—John Hunter supposed that this immunity depended solely on the influence of the vital principle, that life, present in the coats of the stomach, prevents them from being digested by their own secretion. C. Bernard upset this theory by introducing living parts of living animals (ears of rabbits, &c.) into the stomachs of other animals, and showing that they are digested just as any other articles of food. It was next suggested that the mucus of the stomach acts as a protective covering, and prevents the gastric juice from destroying the organ which furnishes the secretion. Pavy has shown this view also to be erroneous by removing large patches of mucous membrane from the stomachs of dogs, and showing that these denuded patches resist digestion as well as in their natural state. He concludes, from his own experiments, that the *alkaline blood*, which is distributed so abundantly to all parts of the stomach, counteracts the effect of the acid gastric juice, and thus prevents self-digestion. He cuts off the supply of blood to the stomach by tying its arteries, and finds that it at once digests itself if a sufficiency of dilute acid be present; whereas, dilute acids may be introduced into the stomach without producing any such effect if the arteries have not been previously tied. On the other hand, strong acid (acid. hydrochl. ʒj. ad ℥j.), kept in contact with the walls of the stomach by tying the œsophagus and pylorus, even though the circulation is not interfered with, causes in a short time self-digestion and perforation of the coats. In the one case, therefore, a want of alkali, in the other an excess of acid, causes the mischief. Lastly, an experiment, which he performed at the suggestion of Dr. Sharpey, seems almost conclusive. Through an opening in the anterior wall of the stomach a portion of the posterior wall is drawn forwards and tied with a ligature, so as to cut off from it all supply of blood; it will be found that the mass thus constricted is digested like a morsel of food. The above theory exactly coincides with one that we heard propounded by Virchow some years ago, in the Pathological Institute at Vienna. In lecturing on the round ulcer of the stomach, he stated that he believed this ulcer to be always preceded by some obstruction in the artery supplying the part affected; that in consequence of such obstruction the alkaline blood can no longer come in contact with the acid juices of the stomach, and the coats of the stomach, beginning with the mucous membrane, are softened and destroyed by the acid at the very part from which the current of blood is withdrawn.

XI. *On the Contractility of Healthy and Paralysed Muscles, as tested by Electricity.* By H. Lobb, Esq. p. 650.—Lobb finds that, in a muscle paralysed by recent injury to the brain, galvanism produces more powerful contractions than in a healthy muscle, whereas in chronic paralysis, from any cause, no contraction can be induced (in this corroborating Brown-Séquard's views already noticed). In cases of chronic paralysis, after treatment by the continuous galvanic current has been for some time employed, and the muscles have become better nourished; if the current be reversed (i.e., if the positive pole be placed on the point of insertion of the muscle, and the negative pole on the belly of the muscle), faint contraction will follow, and gradually increase in force until the muscle is sufficiently restored to contract under the direct stimulus.

XII. *On the Structure and Formation of the so-called Apolar, Unipolar, and Bipolar Nerve-cells of the Frog.* By L. S. Beale, F.R.S.— Professor Beale has communicated in this paper some most important observations which tend to prove "that cells and fibres of every nervous apparatus form an uninterrupted circuit." He subverts entirely the commonly received doctrine as to the arrangement and distribution of ganglion-cells and the fibres in connexion with them. In this, as in the following paper, he is at issue more especially with the Germans. The microscopical preparations which have enabled him to throw such a new light on this subject are represented in a series of exceedingly beautiful drawings appended in eight plates to the paper. They are all made from the common frog or the Hyla (tree-frog); but his inquiries have by no means been limited to the tissues of this animal.

The principal conclusions arrived at are:

"1. That in all cases nerve-cells are connected with nerve-fibres, and that a cell probably influences only the fibres with which it is structurally continuous.

"2. That *apolar* and *unipolar* nerve-cells do not exist, but that all nerve-cells have at least two fibres in connexion with them."

Where such cells seem to exist, their fibres are too small to be seen by the means at the disposal of the observer.

"3. That in certain ganglia of the frog there are large pear-shaped nerve-cells, from the lower part of which two fibres proceed: a *straight fibre* continuous with the central part of the body of the cell; and a fibre (or fibres) continuous with the circumferential part of the cell, which is coiled *spirally* round the straight fibre.

"4. These two fibres, after lying very near to, and in some cases, when the spiral is very lax, nearly parallel with each other, at length pass towards the periphery in opposite directions.

"5. Ganglion-cells exhibit different characters according to their age. In the youngest cells neither of the fibres exhibit a spiral arrangement; in fully formed cells there is a considerable extent of spiral fibre; but in old cells the number of coils is much greater."

This spiral fibre, in a fully developed cell, seems to be coiled round the lower drawn-out portion of the pear-shaped cell, and then to be continued in a spiral course round the straight fibre, each turn becoming more oblique than the turn above it, till at last the spiral lies parallel with the straight fibre, but eventually takes an exactly opposite course in the nerve-trunk. The original formation of the spiral is difficult to account for, but, believing that a power of movement exists in all germinal matter, he thinks it possible that rotation of the outer part of the cell takes place round the inner part; the plastic nature of the cell permitting this.

6. He distinguishes between the formation of ganglion-cells and fibres in very young frogs, and that in fully developed frogs. Fresh cells and fibres are being constantly produced throughout life, almost to the close of its ordinary period. In the very young animal the cells and fibres are formed from *separate masses of germinal matter*, the

fibres having the appearance of granular nucleated bands. In the fully developed frog the cells are formed—*a*, from a nucleated granular mass like that seen in the embryo, but *continuous with nerve-fibres*; *b*, by the division and splitting up of a mass like a ganglion-cell; *c*, by changes occurring in what appears to be an ordinary (?) nucleus of a nerve-fibre.

"7. During the development of a ganglion-cell, there is reason to believe that the entire cell moves away from the point where its formation commenced, so that the fibres connected with it will become elongated.

"8. There are nuclei in the body of the cell, and there are nuclei connected with the spiral and also with the straight fibre. The nuclei in the cell are found upon its surface and also in its substance."

At an early period the cell is nearly all nucleus, or, in Dr. Beale's words, the mass is composed almost entirely of *germinal matter*, with, as yet, very little *formed material* around it. The nucleus is absolutely as well as relatively smaller in the old than in the young cell.

"9. The ganglion-cells of the frog are connected with dark-bordered fibres, and also with fine fibres."

Further, both straight and spiral fibres are seen in his drawings to run into dark-bordered fibres, but the straight much more often than the spiral.

"10. Contrary to the statement of Kölliker, that apolar and unipolar cells are to be demonstrated in the cardiac ganglia, all the cells in these ganglia have two or more fibres emanating from them.

"11. The muscular coat of all the arteries of the frog, and probably of other animals, is supplied with nerve-fibres.

"12. Nerve-fibres are not connected with the connective-tissue corpuscles.'

Lastly, he speculates on the formation of connective-tissue, and supposes that it is the remains of higher tissue, which, after having done its work, has been in part removed, but in part remains as a shrunken material. That therefore which surrounds the ganglion-cells and nerve-fibres is simply used-up nerve-tissue. In the same way connective-tissue in the kidney may be a remnant of defunct uriniferous tubules.

XIII. *Further Observations in favour of the View that Nerve-fibres never end in Voluntary Muscle.* By L. S. Beale, F.R.S. p. 668.—This question, which has been, more particularly of late years, such a bone of contention between German anatomists and our own champion, seems at last to be settled by the English observer. Dr. Beale has succeeded, thanks to the superiority of English glasses, in demonstrating satisfactorily the existence of nerve-fibres continued far beyond the limit at which the Germans suppose them to terminate. He has shown that where the observations of Kühne (who believes that the terminal fibres penetrate the sarcolemma and terminate in special organs of an oval shape within the substance of the fibre), and of Kölliker (who thinks that the free ends of the nerve lie upon the surface of the fibre, and there terminate without penetrating it) end, his own begin. He has not only demonstrated microscopically, but has also made a beautiful drawing of the specimen which confirms his views, that, with a power magnifying one thousand seven hundred diameters, nerve-filaments, far smaller than has hitherto been demonstrated, can be seen crossing and recrossing the muscular filaments, but *nowhere terminating.*[1] The muscle recommended for examination, and used in preparing the above specimen, is *the mylo-hyoïd of the little green tree-frog,* which, from its extreme fineness, can be prepared without the necessity of making sections. He sends a challenge to the schools of Berlin and Würzburg, remarking on the facility which his German brethren have in obtaining the little frog in question. We think it would be but fair to offer *twenty-fifths* in exchange for tree-frogs, if he would have the Germans compete on an equal footing with himself.

XIV. *Experiments on Food.* By W. S. SAVORY, F.R.S.—(Cf. 'Med.-Chir. Review,' vol. xxxii. p. 229.)

REVIEW X.

Dentition and its Derangements. A Course of Lectures delivered in the New York Medical College. By A. JACOBI, M.D., Professor of Infantile Pathology and Therapeutics, &c.—*New York,* 1862. pp. 172.

THESE lectures, addressed to a class of advanced students by the Professor of Infantile Pathology and Therapeutics, remind us of the neglect in our medical schools of this most important branch of medical education. Strange to say, in none of our universities is there any chair set apart for this purpose, nor are we aware that any lectures, either collegiate or extra-collegiate, are delivered in either of them on a class of maladies which are so fatal to so large a proportion of the population, and which from their nature and the special character of the sufferers (both tending to render them obscure and their treatment difficult), almost more than any other maladies, call for special study. Had we before any doubts about the propriety of following the example set us in the United States as to the appointment of such a professor, the perusal of these lectures would have removed them.

Having said thus much, we need hardly add that we have found in Dr. Jacobi's work much to approve and much to admire. We do not propose to attempt a complete analysis of it; that would scarcely be practicable within our moderate limits, or, indeed, from its nature. All that we can attempt is to give our readers some idea, however partial, of its object and its value. Its object, its author tells us, is to prove what we believe all sound physiologists will admit, "that

[1] For his former paper, cf. Philosoph. Trans., vol. cl. p. 611, a short notice of which is contained in this Review, vol. xxxii. p. 473.

dentition is neither a disease nor a direct cause of diseases, except in very rare cases;" and its value, as it appears to us, consists in having proved in a very satisfactory manner—to use his own words—

"That all those diseases of the cutaneous, circulatory, respiratory, and nervous organs, generally attributed to dentition, are in no or very loose connexion with the physiological process of teething; that further, pathological occurrences cannot in themselves be accounted for by a simple and undisturbed physiological process; and finally, that disturbances are very rare indeed."

It is on this account that he declines entering on the therapeutics of dentition, and restricts himself mainly to the consideration of those diseases which have commonly been attributed to teething.

He begins, with much propriety, by pointing out the delusions of mothers and nurses respecting the evils of the process: by whom, he says, it is held to be "the efficient cause of most of the terrible diseases which prove fatal to thousands of the rising generation;" adding his assurance that "this readiness to attribute all diseases of infantile life to teething has destroyed more human beings than many of the wars described in history." He does not spare those of our own profession who are not rid of the prejudice, remarking it would be fortunate were it confined to the public:

"But unfortunately it still lingers in the medical profession . . . . . Nothing is more common than to hear doctors of medicine, young and old, in cases of infantile disease, diagnosticate teething, after mother and nurse had done so before; and nothing is more frequent than to be told that the death of a child was the consequence of dentition. I have seen in this city [New York] a certificate of death in which the direct cause of the death of the child, of five years of age, with his jaws full of teeth, was attributed to teething. Consider for a moment the absurdity of the conclusion that a normal physiological process is fatal to the existence of a living being. Who has ever ventured to assert that menstruation, or pregnancy, or the climacteric years, are the direct causes of death? It is equally absurd to assert it of dentition; yet such statements are daily made by physicians."

In the account which he gives of dentition, anatomically and physiologically, he well points out that the gums of the newly-born, hard and firm as they are, are not covered, as it is commonly said, with cartilage, but with cellular tissue, which is absorbed, as is well known, in the act of teething.

An idea prevalent amongst authors, that late teething interferes less with the general health than that which is premature, Dr. Jacobi meets with the remark that, "in the large majority of cases, a notable retardation in the eruption of the teeth is but one of the symptoms of derangement and faulty development of the osseous system and the organism in general;" adding:

"The bones of the infant should be developed with the same equality as its other parts. Premature teething, premature walking, and premature ossification of the cranial bones, usually coexist: so do protracted teething, retardation of walking, and retardation of the ossification of the cranial bones and fontanelle. They are far from being favourable symptoms, and are too frequently the first symptoms of rachitis."

When treating of mal-nutrition as one of the principal causes affecting the healthy composition of teeth, he with much force and reason adverts to an important physiological fact, that in infants the salivary glands are but little developed, and are consequently unable to supply that fluid, the saliva, by which amylaceous food is prepared for digestion ; and the impropriety, accordingly, of giving such articles as arrow-root, farina, and the like, before the teeth protrude and the glands in question are active.

Sugar too, dietetically, has his consideration in regard to the teeth. He maintains that it is injurious to them on account of its tendency to become acid, and to erode the protecting enamel; and holds nearly the same opinion as to fruits, whether sweet or sour. As to the propriety of always washing out the mouth after eating fruit, which he recommends, we have some doubt—at least as to its necessity—inasmuch as the saliva, in its healthy state, is alkaline, and seems as it were, in this respect, designed to save the teeth from corrosion. As a rule, no fruit should be used, having a due regard for the teeth, which "sets them on edge," that peculiar feeling denoting the solvent power of an acid.

When on the diseases of the mouth and their relation to dentition, Dr. Jacobi points out how rarely mercury produces salivation in young children, or even a mild form of erythematous stomatitis, although at that age the mucous membrane of the mouth is very irritable, having been accustomed only to amniotic liquor in fœtal life, and to milk in the early stage of extra-uterine existence.

In the same lecture some valuable remarks are made on what has sometimes been called membranous stomatitis, better known by the French name "muget," the aphtha lactantium of Bateman, a morbid condition possibly occasioned by the growth of a parasitical fungus, *oïdium albicans*, on the mucous membrane of the mouth, under circumstances commonly of neglect of cleanliness and nursing care. Dr. Jacobi considers pure water as the best prophylactic and curative agent; the only thing worth adding, he thinks, being a small quantity of alkaline salt, such as the chlorate, carbonate, or borate of potassa or soda. He cautions against giving children milk to allay thirst; water is proper for that, and nothing commonly but water.

Vomiting and diarrhœa have too commonly been attributed to teething. In controverting this, Dr. Jacobi, by adverting to the peculiar form of the infantile stomach and the irritable state of the intestines, shows that both should rather be viewed for most part as healthy than morbid actions, the one depending on the facility with which the former, owing to its shape, rids itself of any excess of food; the other, on the readiness with which the latter, owing to its sensitiveness, discharges its contents, if at all noxious. Amongst the numerous causes of diarrhœa, besides unwholesome ingesta, he attaches importance to atmospheric temperature, remarking, that whilst dentition is independent of season, that form of the disease known by the name of cholera infantum will frequently appear in New York about the middle or end of June, reach its height as to number and severity in July and August, diminish in September, and disappear in October, whilst in the southern climates it will appear sooner.

On mucous membrane there are some excellent observations. The following is an example :

"In regard to the diseases of mucous membrane, I have already stated both their frequency of occurrence and their proclivities for complication. Their tendency to sickness, however, is not uniform, individuality and age belonging to those influences which are most apt to modify the alterations taking place in their tissue or secretion. Affections of this membrane are very rare in fœtal life, because of the absence of both mechanical injuries and functional disorders. In infantile age the mucous membrane reaches its greatest importance, new influences acting upon it and calling into life new functions, especially the normal state of injection, which is very considerable indeed. A very common alteration taking place in the mucous membrane is mollification; plastic exudation, hæmorrhage, suppuration, and ulceration being very rare in the first year of life. After this time exudative processes are more numerous—especially fibrinous exudations are not unfrequent. This predisposition of early age to contract diseases of the mucous membrane is afterwards decreasing, is not very common in advanced age, until in senile age it is rather increasing."

We give another example. Referring to the vast variety of morbid affections (there is a long list of them) once assigned to mucous membrane in connexion with teething, he remarks :

"The greatest stress has been laid by me on the large number of slight or unimportant causes giving rise to affections of the mucous membrane. That in some cases an abnormal process of dentition will prove a source of evil, I do not deny; but from many previous remarks, and from comparison with other causes of disease, you have arrived at the conclusion that the vast majority of the diseases of this membrane allow of another explanation than the blind assumption of the culpability of a physiological process. The great progress of pathological anatomy and differential diagnosis ought not to be lost on us. The period when the diseases of small children consisted in dentition, of advanced ones in worms and scrofula, of adults in rheumatism, scrofula, and syphilis, is past."

Three pathological conditions of the urinary bladder in infancy have been attributed to dentition—viz., catarrh of the organ, incontinence of urine, and ischuria—and, as Dr. Jacobi is satisfied, incorrectly so, other and more efficient causes being assignable, either organic or functional, such as feebleness of the muscular layer of the bladder, diminished or increased sensibility, flatulence, &c. When incontinence of urine, marked by wetting the bed, occurs, owing to too great sensibility of the organ, a sure remedy has been found by Dr. Jacobi, in great majority of cases, in administering internally a quarter or a third of a grain of the alcoholic extract of belladonna at bedtime; it acts without affecting the pupils, as in the instance of adults.

Treating of the diseases of skin which are so common in infantile life, Dr. Jacobi makes some valuable remarks on what has been called the jaundice of the new-born, showing that it is owing to the sudden change of the circulation accompanying that event, and the consequent injection and high colour of the cutis, with a transudation of hæmatine, which, during its absorption, as in the instances of suggillation and ecchymosis, is productive of a greenish-yellow discoloration. This spurious jaundice, he well insists, should not be confounded, as it occasionally has been, with the dangerous icterus attending inflammation of the umbilical vessels with pyæmia.

As to cutaneous diseases generally, he sagaciously remarks—

"That there is between the protrusion of a tooth and the appearance of the larger number of these diseases no direct relation as to causality; that they do not show themselves with the swelling of the gums; that they do not disappear with or after the final protrusion of a tooth, or a group of teeth; and that they do not return with the renewed attempts of another tooth, or group of teeth, to break through the gums. Only those forms of cutaneous disease scarcely deserving of a name, which depend on occasional hyperæmia of the surface, brought on by general feverish irritation, or the physiological injection of the bloodvessels of the head about this time, are observed during the period of dentition. They and the absence of correct diagnosis generally, and the frequency of skin affections at this early period of life, are the reasons of the long continuance of the old assumption of a connexion between external diseases and dentition."

On fever in relation to dentition, we quote one passage marking well the acumen and judgment of our author:

"You must never forget that the range of health is wider than is sometimes assumed. Tissue generally, and bloodvessels especially, bear a certain amount of injection without exhibiting any symptoms of feverish reaction or other diseased function. Thus you would be greatly mistaken if you took the occurrence of fever during the protrusion of a tooth to be a necessary symptom. A physiological process does not include, from necessity, a pathological consequence. Thus you have to be careful in judging of a case of fever in a teething infant. If there is a difficulty in diagnosticating pathological conditions of the infantile organism, it consists in the explanation and localization of fevers. For almost every fever in infantile life will yield a local cause to an attentive observer; even such fevers as are frequently not shown by anomalies in internal organs in adults—catarrhal fevers, for instance—will be attended in children with decided symptoms of a catarrhal nature on some one of the mucous membranes, and recognised as such. I always return to my old assertion, that the diagnosis of infantile diseases is by no means more difficult than those of adult life; but care and attention and close observation are required."

Enforcing caution on his audience as to the risk of mistake in making the diagnosis of difficult dentition and dental fever, he says that during the last three years he has attempted it once:

"The infant suffered from severe fever, without apparent either local or constitutional cause; two days after my diagnosis the infant had variola. Since that time I have mostly left the diagnosis of dental fever and difficult dentition to mothers, and have made one of my own."

Dr. Jacobi's observations on convulsions and nervous affections, in which teething is so commonly supposed to be concerned, are deserving of particular attention, and are brought forward in a very interesting manner. One quotation—his account, viz., of the peculiarities of the infant's brain, and the deductions from those peculiarities—is a good and instructive example:

"Now, the principal results of these carefully collected and compared figures" (of the brain of the infant and adult) "are, among others, these: The anterior lobes of the large hemispheres are small in proportion to the bulk of the brain. The cerebellum also is small in proportion to the cerebrum. Both the anterior lobes of the large hemispheres and the cerebellum grow more rapidly in early infancy than the generally rapid development of the infantile brain would explain. That the brain itself grows most at the same period, in proportion to the other organs of the body, I have often had an opportunity of telling you. Finally, there is little cortical, grey cerebral substance, and not the distinct difference between the grey and the white substances of later life.

"Just draw your physiological conclusions from these facts; translate, as it were, anatomy into physiology. The simplest physiological facts you would conclude, from the data I have given, are these: The mental, intellectual faculties of the infantile brain are little developed; the less the earlier the period of our observation. The power over the voluntary muscles is very limited indeed. The mutual counterbalancing of the really central, and the conducting portions of the brain is not well pronounced. There is, with the intense growth, intense action of the brain, in its course of development. The less settled the condition of an organ, the more it is exposed to irregular action. Therefore the great irritability of the brain in general is well explained by its anatomy, but particularly the intense irritability of the anterior lobes of the large hemispheres and the cerebellum."

In cases of convulsions, which our author holds are no disease, but the symptom of some morbid alterations or irritations, these numerous and various, he deprecates the common practice of wantonly cutting down into the gums of the child afflicted with some unexplained ailments, and is altogether opposed on this point to the views of Dr. Marshall Hall, whom he designates "the most emphatic eulogizer of the scarification of the gums." He quotes these views at some length, fixing on the last sentence for animadversion. The passage is: "There is a phrase among nurses—viz., the breeding of teeth, which may be taken as evidence that *before* the teeth actually reach the borders of the gums, they may prove the source of much irritation." Dr. Jacobi comments:

"When 'a phrase amongst nurses' is taken as 'evidence,' or when every case of convulsions is attributed to the process of dentition, because now and then a fit will occur in consequence of some irregularity in the protrusion of a tooth, we may have to expect such practice as recommended in the quotations" (those of Dr. Hall) "you have just been listening to."

We entertain, however, no doubt of the existence of cases in which convulsive attacks of the most formidable nature, and tending to very disastrous results, are quickly and immediately removed by lancing the gums; and such, indeed, most medical men perhaps must have met with in the course of continued practice. We cannot, moreover, fail to recal to mind that the great Sydenham, as well as certain modern nurses, spoke of the "breeding" of the teeth, and connected cough, diarrhœa, and epilepsy with the process, as may be seen in the 'Anecdota Sydenhamiana.'

In another place, treating of laryngismus, he remarks, adverting to teething being taken for one of its causes ("that nightmare of both the public and of many medical men") he adds:

"They may almost be excused by you on learning that such men as Marshall Hall direct in laryngismus the gums to be incised in different places and directions once, twice, or even three times a day, and expect a cure from this sort of butchering art or scientific butchery. I warn you most emphatically against following his advice to the extent in which it is given. In some cases incisions into the gums may be indicated, and I sometimes make them myself; but this readiness to operate on helpless children who are so unfortunate as to 'teethe'—that is to say, to be from six to thirty months old—is, to say the least, a mistake."

Dr. Jacobi's concluding lecture, the thirteenth—the shortest, but not the least characteristic and valuable of the course—is on the means of alleviating dentition. The therapeutics of dentition, as already mentioned, he altogether avoids as uncalled for, holding that dentition being a physiological process, like the growth of the body, there is no treatment of dentition as such. The little he recommends in the way of help and alleviation is, first, "the use of such articles prepared from leather, wood, bone, Indian-rubber, which may help the little ones in the work of the gradual absorption of the gums, or may relieve whatever annoying sensation they have, or are supposed to have;" and secondly, cutting on the gums with the lancet, when they are a decided impediment to the protrusion of a tooth, or are themselves the seat of disease (such as hyperæmia and inflammation), giving rise to general symptoms, especially of the nervous system, always being sure, in the former instance, that the tooth is near the surface.

We have made our notice of this work longer than we had intended, and yet, we think, not so long as it deserves; it is a happy example of the application of physiology to pathology, and by the differential diagnosis, the elimination of the co-incident from the incident—the non-essential from the essential.

We must not conclude without adding a word of praise regarding the style of our author. It is simple, clear, and vigorous, and is often enlivened by remarks with a tinge of grave humour, especially when reflecting on the crude notions of nurses and their prejudices, and the impositions of quacks which they encourage, and more than enlivened, enriched by interesting particulars respecting dentition drawn from the curiosities of medical literature.

Review XI.

The Journal of Mental Science. Edited by C. L. Robertson, M.D. and Henry Maudsley, M.D. (Published Quarterly.)

Unlike most periodical publications, of which the name now-a-day is Legion, this Journal is the accredited organ of an Association, and published at the general cost of its members. The Association rejoices in the long-extended title of "The Association of Medical Officers of Asylums and Hospitals for the Insane"—an unwieldy appellation rarely encountered in its entirety except in print. Moreover, if the list of members and the rules be examined, it appears pretty clearly that the name is objectionable, not only by reason of its prolixity, but also as a misnomer, for neither are all the members medical officers of asylums and hospitals for the insane, nor is such an official position requisite for membership. We would therefore, with all becoming deference to the distinguished members of the Association, suggest the desirability of a shorter and appropriate designation. In Paris there is a much honoured and flourishing "Société Médico-Psychologique," having a recognised periodical, the 'Annales Médico-Psychologiques.' The word psychological is certainly crooked enough, but it has now become familiarized by use, and a Medico-Psychological Society would be as euphonious a term as is that of the "Medico-Chirurgical Society," and much more practicable to the vocal organs and respiration than the long-winded name at present imposed upon the Association.

However this question of its appellation may be determined, the existence of the Association is of itself an indication of the extraordinary progress that has taken place in all that relates to the care and treatment of the insane, and to mental disorder as a subject of study and of special practice. To judge of the rapid strides that have been made in these matters, we have only to refer back to the Parliamentary inquiry of 1815, and to contrast the asylums existing at that date in respect to number, organization, and medical supervision, with those of the present period. Such a reference and contrast show that mental disease as a branch of medicine pursued by a body of special practitioners is a development of the last fifty years. The treatment of the insane has passed out of the hands of men, mostly lodging-house speculators, and not members of the medical profession, to those of well-educated medical men, almost invariably trained to their duties as superintendents by previous service as assistants in asylums. And the increase in the number of asylums has so multiplied that of "psychological physicians" or "psychiatrists," that the list of Association members now reaches to about two hundred, exclusive of honorary members, and a small proportion of the asylum superintendents of the country not enrolled in it.

The Association in question was established in 1841, but with what scope of operations and with what organization, does not appear. Evidently its beginning promised little and effected little, while its members also were very few. As a public body, with some recognised objects, it acquired form and position with the publication of the 'Asylum Journal,' in November, 1853. The Journal so started was less ambitious in design, and of much more slender proportions than the dignified Quarterly which has now, in due course of development, replaced it. It was, until nearly the close of 1855, a nursling of sixteen pages, double columns; it has now reached its eleventh year of existence, and grown into ten sheets of print, with evident powers of vigorous future growth. It originally babbled in short papers on various details of asylum management and of medical and moral treatment; it now discourses learnedly on psychology, and discusses the more recondite questions concerning the pathology and jurisprudence of insanity.

In its earlier years it was entrusted to the sole care and management of Dr. Bucknill, then superintendent of the Devon County Asylum; but in 1862 that excellent manager resigned, and, in its then already acquired quarterly form, it was transferred to Dr. Lockhart Robertson, of the Sussex Asylum, who has during the last year divided the responsibilities and labours of his office with Dr. Maudsley.

There was an oddity about the first title adopted for the Journal—viz., 'The Asylum Journal of Mental Science,' which was remedied after the fourth volume (in 1859) by dropping the word "Asylum;" but the title even as it now stands is scarcely applicable to it, for the term "mental science" is of wider meaning than the proper end and aim of the periodical. The former editor, Dr. Bucknill, anticipated this objection, and sought to justify the employment of the expression. He thus writes: "In adopting our title . . . . . we profess that we cultivate in our pages mental science of a particular kind—namely, such mental science as appertains to medical men who are engaged in the treatment of the insane;" and then, to serve the purpose of argument, drags in the word "metaphysics" to represent "speculative mental science" as something different from the division of the subject previously defined. The apology for the title is, however, too long to introduce here; and we moreover look upon it as faulty, for its author recognises the words "mental science" as constituting a general term, having two parts or forms, and yet proceeds to apply it to one of these—viz., that form in which medical men engaged in the treatment of the insane are practically interested.

The intended object and scope of the Journal are set forth in the first number. The leading principle in its establishment was that it should serve as a medium of inter-communication between the members of the Association, and as a record of improvements in the management, &c., of asylums, and of experience in the treatment and pathology of insanity. Other objects to be attained were the recording of the proceedings of the Association at its annual meetings, notices of alterations in the law affecting asylums and the insane, and of the Reports of the Lunacy Commissioners, and the advertising of appointments and particular occurrences in asylums. Short reviews of new books and abstracts from home and foreign periodicals and treatises constituted another department of the Journal.

Whilst yet limited in space to a single sheet, appearing twice in a quarter, the prime purpose of the paper as a means of communicating hints and suggestions gathered from practice, and of discussing the practical value of plans of administration and construction, was remarkably well sustained and carried out by the members of the association. But as it grew older and more bulky as a quarterly production, it became the vehicle for more studied essays and psychological dissertations, at the sacrifice of much of its original character and purpose, which have never again been revived.

This change in its scope probably was inevitable—most medical men like those in charge of large asylums having abundance of work on their hands, most of it of such a character as to foster a system of daily routine, and much of it calculated to divert attention from books and literary composition. Hence it may, we conceive, have come to pass that writers of brief practical papers and memoranda fell short in number, and that thus the task of supplying the necessary quantum of matter to fill the pages of the Journal devolved upon the few having more leisure or more readiness for authorship to be exerted in set papers and critical disquisitions of greater pretensions. However, whether this surmise as to the altered character of the Journal be true or not, the change is in some measure to be regretted; not, indeed, that we undervalue the admirable papers which have from time to time appeared in its pages, but that we would prefer seeing more practical notes and queries and more frequent reports of interesting cases—of their treatment and morbid anatomy.

Whichever point of view we take, the conclusion forces itself upon the mind that both the amount and variety of information to be contributed, and the number of actual contributors to the contents of the Journal, ought to be much larger, and particularly with respect to original practical communications. For instance, if we look to the members of the association who support the Journal, we find a body of two hundred medical men practising in a well-defined special branch of medicine, which may fairly demand a special periodical publication to represent its state and progress. But, still more, these gentlemen are physicians to institutions within which their patients are congregated and submitted to continued observation; and many of these institutions, particularly the public ones, are of large size, and afford most extensive fields for study and research. There must be, therefore, as the editor records with gratification (vol. i. p. 4), as the emphatic declaration of the venerated Dr. John Conolly, an abundance of "treasures hitherto hidden in asylum case-books." Yet comparatively few of these treasures have been extracted and made available, notwithstanding the ready medium of communication offered for the purpose in the periodical under notice. Regard being had to the extended opportunities of investigation they possess, and to their special occupation with one class of diseases, it certainly is surprising, but not flattering, to the superintendents of asylums, that as a body they have contributed so little to the advancement of our knowledge of the pathology of insanity.

Moreover, even were their number smaller, and the available materials to put upon record less abundant, there is a further reason why the medical men of asylums should appreciate their own journal as a means of communication between themselves, and should generally co-operate in filling its pages—viz., their more or less isolation from each other; and in consequence, the rare opportunities they possess for comparing the results of experience, and for benefiting by that attrition of mind enjoyed by others daily brought into contact in the course of practice. Isolation, whilst it throws the asylum superintendent upon his own resources, and so may develope his inventive faculty to meet peculiar exigencies as they arise, does at the same time foster routine and inertness. Without the medium of a journal to communicate the practical suggestion or the observed morbid phenomenon, isolation equally proves fatal to these lessons of experience, or its effects are only partially obviated by the annual excursion indulged in by most superintendents, and during which they may hear of some of the useful expedients and practical discoveries arrived at by a few of their colleagues in other asylums.

Where non-restraint has been accepted as the principle of action in an asylum, whereon does the success of management depend except upon the little things, upon the minor details to be kept in view and carried out? The foreign physicians, who do not comprehend the practice of non-restraint, are perpetually exciting themselves in opposition to it from some conceived erroneous notions they take into their heads that this or that grand scheme of action is the essential element in the practice. When, however, they will submit to learn by study and observation within the walls of an English asylum, their preconceptions vanish, and they marvel at the simple, though multiple conditions, which concur to render non-restraint a reality in practice. Again, the history of non-restraint is the history of details of experience, of the suggestions that have occurred to this and that physician to meet the ever-varying requirements of the insane, having their moral and mental well-being in view without infringing upon their liberty; and unless it is held that the condition and management of the insane are perfect, there must still needs be many such minor practical details worthy of discussion and record in the Journal of the association.

We should like to know that the editors of this Quarterly encouraged the contribution of such communications as we have referred to, and also of clinical records. Psychological dissertations, essays on the science of mind, and the like, doubtless form agreeable and instructive reading, when well written, as those are which have fallen under our notice in the journal in question; but we apprehend they find few readers among the working members of the association, to whom they are necessarily principally addressed; and we hold that it would be a mistake to give them a prominent position in the periodical. The 'Psychological Journal,' formerly edited by Dr. Winslow, but now extinct, had a large infusion of theoretical and sentimental psychology, written to attract, but its circulation was small, and failed, we presume, to make it a successful commercial speculation, although addressed to the public at large. Indeed, that sort of writing is little read among men engaged in the active duties of life; and will be so, we feel sure, among asylum superintendents, amid whose ranks are few literary *dilettanti.*

Unlike most associations of scientific and professional men, that of the "Medical Officers of Asylums and Hospitals for the Insane," is little occupied in cultivating and promoting the advancement of the department of medical knowledge it deals with, by the ordinary apparatus of papers and communications read at meetings. In fact, it meets only once a year for about a day, and on those occasions the time is chiefly occupied with formalities—with the election of its officers for the year, the discussion of rules for its government, and the presidential address, usually devoted to a *résumé* of Parliamentary legislation on insanity, a notice of medico-legal cases, and of the general status of the Association and its members, and similar topics. Some two or three papers may be read, but there is little time to discuss them. The report of the meeting, the presidential address, and the papers read are published, as a matter of course, in the 'Journal;' and so far this publication may be considered the vehicle for the transactions of the Society. These matters, however, form a very inconsiderable section, though we opine they are commonly more read than most of the other contents.

It would be impossible, in the space of an article to review a tithe of the many excellent papers which have appeared in the 'Journal of Mental Science' since it was started into existence. We have commented freely on its general scope and character, and will limit our concluding remarks to the order of contents pursued at the present time, and to the manner in which certain sections are carried out.

Original articles have always constituted the staple matter of the 'Journal,' and taken the precedence in the order of contents; but it was not until 1863 that a division of the subjects treated of into several parts was made by the then sole editor, Dr. Lockhart Robertson. This subdivision is an improvement, and in form resembles much that pursued for many years by the conductors of the 'Annales Médico-Psychologiques.' Part I. is devoted to original articles, including clinical cases; these latter are, however, of not frequent occurrence. Part II. is occupied with reviews of books, and rightly of such as relate more or less directly to the special subjects which the 'Journal' professes to discuss. And we consider it desirable that the editors should carefully restrict themselves, in their critical notices, to such works; for, on the one hand, the production of treatises upon insanity and asylums, abroad and at home, is sufficiently abundant to constantly furnish subjects for reviewing, and, on the other, the critical examination and analysis of other productions of the press not devoted to those topics, is an uncalled-for intrusion upon the sphere of the many general medical periodicals, weekly, monthly, and quarterly, which make reviewing a principle feature in their plan. We make these observations because we notice in the last number, for July, 1864, a review of a work which doubtfully falls within the proper scope of the 'Journal'—namely, the Essay by Dr. Anstie on Stimulants and Narcotics; and, in the list of "publications received," several books figure which have no intimate connexion with psychological medicine. Part III. consists of a "Quarterly Report on the Progress of Psychological Medicine," English and foreign. This section resembles much the quarterly 'Chronicle of Medical Science,' that forms an integral portion of this Review, and, like it, must prove of great interest and instruction to the readers of the 'Journal,' by placing them *au courant* with the psychological literature of the day. Moreover, by means of its brief abstracts of books and papers setting forth novel hypotheses, suggestions, and hints in pathology and treatment, it gives in some degree to the 'Journal' that character which at its origin it especially possessed—viz., as a medium of communication of the teachings of experience. The fourth and last part consists of notes and news, foreign and domestic, relative to asylums and their officers, and cognate matters.

A general review of the contents of the 'Journal of Mental Science,' from its commencement, must conclusively prove the value of that periodical not only to the members of the Association who concur in its publication, but also to the medical profession at large. We will not attempt to specify particular papers, but only observe generally that throughout the several volumes already issued, papers of great merit and originality are to be found, written by physicians of well-known experience and position. The subject of mental and nervous disorders is sufficiently extensive and its unsolved problems numerous enough, and also the number of medical practitioners specially engaged in treating those disorders is sufficiently large, to justify the publication of a journal especially devoted to their consideration; but on the whole we must confess that, in our opinion, the journal in question has not given that attention to the pathology of the nervous system it deserves; or rather, in other words, the members of the Association have not made that use of the splendid opportunities they possess to advance our knowledge of that subject.

Review XII.

1. *Stimulants and Narcotics: their Mutual Relations.* By F. E. Anstie, M.D.—*London*, 1864. pp. 489.
2. *The British Pharmacopœia.—London*, 1864. pp. 444.
3. *Lectures on the British Pharmacopœia.* By A. B. Garrod, M.D., F.R.S. ('Medical Times and Gazette,' 1864.)
4. *Companion to the British Pharmacopœia.* By Peter Squire, F.L.S. —*London*, 1864.
5. *Essentials of Materia Medica and Therapeutics.* By A. B. Garrod, M.D., F.R.S. Second Edition.—*London*, 1864. pp. 391.
6. *The Calabar Bean.* By F. R. Fraser, M.D. (Pamphlet.)—*Edinburgh*, 1863.

In the present day, when the science of medicine has advanced with such rapid strides, in consequence of the discoveries made in the departments of physiology and pathology, we cannot but feel some surprise that in therapeutics no corresponding progress has been made. The 'British Pharmacopœia' has, indeed, cut off one or two of the old list of stock remedies which occupied a place in the pages of its predecessors, and lumbered the shelves of the druggist's shop, without being ever seen in a modern prescription. It has added a few which had gradually grown into repute, and seemed to have established a claim for representation; and while the advantages of some of these are questioned by the very highest authorities, others have been passed over which probably have at least equal merit. It is not our purpose to add our strictures to those which have been so freely passed on the new Pharmacopœia. The task of reconciling conflicting opinions and prejudices was no easy one; and however carefully the committee may have been selected, it was almost unavoidable that each member should strive to introduce or retain those remedies which he had been in the habit of employing, and at best the result could only be a compromise. Our object in calling attention to the subject now is, to ask what signs of progress can be discovered. Is the medicine of 1864 at all an advance of the medicine of 1851, when the College of Physicians issued its last 'Pharmacopœia Londinensis?' This question cannot be answered simply by looking to the list of additions and omissions. It does not indicate much progress that wormwood or quince-seeds, cowhage or pennyroyal should have been omitted; though we may feel some surprise that the relics of a bygone age should have held their ground so long in the face of advancing knowledge. Some, perhaps, may regret the loss of canella-bark or lettuce-opium; but Dr. Garrod assures us that "in no one instance did the lactucarium or extract of lettuce (in very large doses) produce any direct tendency to sleep, nor, in cases where pain was present, was relief obtained." The hospital physicians in Paris will feel some surprise how we can dispense with a remedy so much in use among them as the marshmallow. Much cannot be said in favour of such additions as arnica, bael, hemidesmus, cherry-laurel, or matico. It may be doubted whether, in the addition of Bebeeru bark and chirata, we have improved upon cinchona and gentian. In Indian hemp we have a valuable narcotic, which has been long in use; and the carbonate of lithia is, perhaps, one of the most important additions to our stock of useful drugs. The anthelmintics have been enriched by the addition of kousso, kamela, male fern, and santonica; and, strangely enough, the two latter, after having taken their place in earlier editions of the 'Pharmacopœia,' the one in London and the other in Dublin, were removed from the last editions, to be again restored to us in the new work. A similar fate attended the bromide of potassium, which was introduced into the London 'Pharmacopœia' of 1836, expunged in 1851, and is now restored in 1864. Practical men were all the time using both the male fern and the bromide, and believed that they were efficacious for the purposes for which they had been employed; and the Edinburgh 'Pharmacopœia' retained the former throughout. Aconitine has gone through a similar course, having been first made officinal in 1836. The difficulty of its preparation, its immense cost, and the great uncertainty of obtaining it in a pure state, caused its omission in the subsequent 'Pharmacopœia;' and it is now restored because some of these difficulties have been overcome. Podophyllum, which was announced not very long ago as a substitute for mercury, takes its place probably as an addition to purgatives; but to our surprise no place is found for such a remedy as oxalate of cerium, which, though not heralded with such a flourish of trumpets, has been successfully employed by men of at least equal standing in the profession.

It is not easy by such marks to note the advance of the practical department of medical science. The old familiar remedies, which have changed their names over and over again, are still those which are used with the greatest confidence and the most unvarying success. New medicines are suggested by one generation, and forgotten by the next; the list of antiquated formulæ and useless ingredients is constantly being curtailed to afford space for new suggestions; and among these one or two hold their ground after a lapse of years as valuable acquisitions. These, however, are very generally little better than mere accidents. Scientific progress is not to be measured by the number of such chances. The real test of progress is the degree of certainty attained in the use of those which we possess. In this respect, one very decided step has been made, in the comparative simplicity of the formulæ of the present day. The physician's prescription does not now-a-days generally contain a combination of all known substances which possibly might cure the disorder, and he has consequently some chance of ascertaining whether the effect he anticipated has been produced by the drug prescribed. Unfortunately, very few attempts have been made to ascertain the powers of remedial agents in a legitimate manner, and the conclusions very generally rest on a mere vague impression, which has never been put to the test of fair experiment. We may appeal to most of our readers whether it is not the case that they use many remedies of which they can give no account to themselves, and of which they know nothing beyond their experience of their value. We may also appeal to them whether they do not find a remedy answer in their own hands which is regarded as uncertain or useless by others. We need only say, in confirmation, that at one period we have found ourselves relying on a certain mode of treatment which at a subsequent period has seemed to fail in fulfilling the very same purposes.

We ought not in the present day to be thus groping in the dark, and we could wish that some degree of certainty could be arrived at with reference to a few even of our simplest remedies. But the difficulties in the way of making the observations necessary to settle some of the very simplest questions are not easily performed, and require considerable judgment and experience to avoid sources of fallacy. Dr. Garrod has done much to aid in the solution of such questions, and the results which he has communicated to the profession are such as cannot fail to secure their confidence in his observations. The account which he gives of the action of arnica (Lecture I.) seems to us perfectly conclusive. The only point of which the advocates of arnica can avail themselves to invalidate his conclusion is, that the congestion produced by the application of the cupping-glasses does not exactly represent the effect of an ordinary bruise, and also perhaps that a more immediate application might have modified the result. These objections do not appear to us to have much weight, and we think might be easily answered by fresh experiments. The experiences detailed satisfy us that Dr. Garrod is by practice competent to make such inquiries, and give us great confidence in the affirmations he makes on the actions of other remedies.

The experiments on manganese and glycerine, detailed in Lecture III., though not given so fully, indicate the same sort of intelligent investigation of the powers of remedies; and we trust that ere long other observers of equal competence will add to our knowledge of the true uses of drugs, which, though subordinate, is still so important a part of the science of medicine.

Two great difficulties stand in the way of forming correct conclusions. On the one hand, when we have learned from experience that some particular remedy is efficacious for the cure of a special disorder, we are sometimes quite unable to trace its *modus operandi*, or even to point out the organ upon which it acts; and on the other hand, when we know for certain that a drug has a definite, almost an unfailing action on some organ, we are still quite uncertain whether that action will be beneficial to the patient or not. These questions, no doubt, involve others of still higher importance, the solution of which is as yet almost unattempted: such as the mode in which organs are affected by medicinal agents, whether by being brought into contact with them through the medium of the circulation, or by previously producing some change in the condition of the blood which secondarily reacts upon the organ, as well as the character of the change which is in either case brought about. Physiology is probably not sufficiently advanced to suggest the answers to the more obscure of these inquiries, but we are surely in a position to determine by properly conducted experiments whether certain remedies do or do not influence certain organs, and the direction of that action.

It is quite impossible to reason rightly about therapeutical agencies if we have regard only to their ultimate effect; and we must of necessity err if we assume that, because the issue is the same, the means by which it is produced must have similar powers and act in an analogous manner. No one is prepared to assert that the various remedies which used to be grouped together under the title of emmenagogues had any similarity in their action, although each was occasionally employed for the restoration of the uterine functions. The causes of the suspension of menstruation, though not very numerous, are yet considerably varied; and the ultimate end attained in its restoration is brought about in such a very different manner in different cases, that the whole group has been broken up into fragments in treatises on therapeutics, and the name almost banished from scholastic teaching. It is one of the great tests, as we think, of progress, that we talk so much less of curing or relieving a disease by remedial means than was done in former days, and that we direct our attention more to alleviating distressing symptoms, correcting deranged functions, and controlling irregular or abnormal action; endeavouring to act as the assistants of nature in the progress of the case, following her lead, and aiding her powers. Dr. Garrod says on this subject:

"No one who has studied the progress of medicine within the last quarter of a century can blind his eyes to the fact that a great change of opinion has been, and is slowly but steadily going on, in regard to the treatment of disease —a change which will doubtless ultimately prove of the highest importance and value, although for a time causing shipwreck to many minds, leading some to the very depths of scepticism as to the effects of medicines, others to embrace hypotheses the most fanciful and absurd. . . . .

"In all therapeutic inquiries there is one point which it is most important not to overlook,—I allude to the natural and powerful tendency of disease to run a definite course, and the difficulty, in many cases, of influencing this progress, even by what we are induced to look upon as potent remedies. This is a most important consideration, and the neglect of it has often caused much difference of opinion as to the best mode of treating various diseases. Statistics are appealed to, and it is found that treatment, apparently the most opposite, leads to results the most similar. Such discrepancies may often be reconciled; but, in many cases, it is owing to the fact, that our treatment has been inoperative either for good or for harm, and the disease has followed its own course, without heed to the medicines which we have employed for its arrest. I need not here, before such an audience, quote examples to prove the correctness of this statement.

"On the other hand, who can doubt the efficacy of drugs, if he has watched their effects in alleviating suffering and effecting cures? Who can doubt our power of alleviating pain—of arresting inflammation—of checking intermittent fever—of allaying irritability of various organs—of procuring sleep? One must be blind not to allow this power; and this proved, we have at once a groundwork upon which to proceed further."

Nothing at first sight seems simpler than to assert that alcoholic stimulants and narcotics act upon the brain; but it has been suggested, and not without plausible reasons being assigned, that the change takes place in the blood itself, and not in the nervous system. The blood, altered by the presence of opium or alcohol, for example, as it is alleged, acts on the brain in the same way as blood altered by the presence of carbonic acid; and therefore, presumably, the change takes place in the blood and not in the brain. We are not prepared to return to this humoral pathology, and we think it much more likely that the substance present in the blood acts directly on nerve-tissue in circulating through it, whether that be carbonic acid, opium, or alcohol. There are far greater difficulties in the way of supposing that all substances capable of producing coma reduce the blood to the same condition, than that they all have an analogous action on the brain. Just as we believe that certain purgative medicines produce very analogous effects on the alimentary canal without our necessarily supposing that in all the blood is similarly altered, merely because some conditions of blood change are attended by diarrhœa.

When we proceed further to inquire in what way their influence is exhibited, we at once plunge into a subject beset with difficulties and hampered by prejudices, which are clung to with all the greater tenacity because they are based on a partial truth, and the darkness is so great that men are unwilling to let go the clue which has been hitherto their only guide, until they have got hold of something more satisfactory, which they may follow with more confidence for the future. Dr. Anstie, in the work which stands at the head of our list, has attempted not unsuccessfully to combat these prejudices, and to substitute a new theory of stimulants and narcotics for that which has been so commonly taught. And while we purpose freely to criticize his arguments, and are by no means prepared to go the length he does either in the work of demolition or reconstruction, we are bound to record our opinion of the thoughtfulness and extensive study of his subject which specially characterize this contribution to the literature of the transition period of medical science.

The terms which we are in the constant habit of using have perhaps a greater tendency to create confusion than those employed in any other department of knowledge. They are so bound up with the theories of a bygone age that it is almost impossible to speak of the simplest subject without using language which, if closely analyzed and traced back to its source, would necessarily convey an erroneous impression. At the same time, we think it quite possible to use such words in a conventional sense, without implying that we thereby mean to revert to the old theory from which they sprang. The interest attaching to that part of Dr. Anstie's work which carries us back to the origin of the idea of stimulation is purely historical. We confess that we never do think of the "vital spirits" or "the principle of life" when we employ the term stimulant, and do not see that it has much bearing on the question of the modern signification of the word. It is not surprising that, in the face of such hypotheses as were held in former times, it was not possible to obtain anything like a correct notion of a stimulant; and we turn to the later writers in the full expectation that we shall have such a view of their action given as shall at least convey to any intelligent student some idea of the class of remedies to which this name is given. "To the layman," says Dr. Anstie, "the word has a definite meaning;" to him it represents a class of "grateful restoratives." "To the busy practitioner" the word stands "for a class of remedies which he has frequent need to use when he desires to produce a rapid revival of vital powers which are temporarily depressed." It is only when a scientific interpretation of the term is attempted that so much difficulty is experienced. Dr. Anstie has placed before us the views of Pereira, Neligan, and Wood; and we confess that with him, after their perusal, we are very much inclined to come to the conclusion that it would be better to make a *tabula rasa* and begin with some new theory. But before this can be well done, it would seem necessary to make some preliminary inquiries, and ascertain if possible on what organs, through what channels, and by what means, stimulants act. Do they act on the brain when given only in stimulating doses?—or is their action on the brain something different from their action as stimulants? Does ammonia ever act on the brain at all? It certainly gives us no evidence by mental phenomena of any such action; and if it be taken as the type of a true stimulant, we should be inclined to come to the conclusion that stimulation was not produced by means of the brain at all, but through some other portion of the nervous system. We confess that we should have been more satisfied with our author if he had given us categorical replies to such questions before attempting the "reconstruction of the theory." We prefer the definition of a stimulant as represented in the ideas of the "layman" and the "busy practitioner" to the conclusion which he proposes for adoption—that the "word 'stimulant' be restricted to agents which, by their direct action, tend to rectify some deficient or too redundant natural action or tendency"—a definition which to our apprehension exactly corresponds to purgatives and bowel-astringents.

Dr. Anstie does not attempt to analyse the action of these remedies in the economy. His object seems to be to point out what he conceives to be an erroneous estimate of their value and uses in disease, and to give what may be called a practical turn to the manner in which we employ them. His work is eminently thoughtful in character and felicitous in expression; but we miss the experimental talent which Dr. Garrod seems so evidently to possess, and we are left with the feeling, after reading Dr. Anstie's work, that our train of thought and his do not lie parallel, and that, though there is much in the arguments he uses, yet there is a great deal to be said on the other side. We feel that in following his leading we are discussing hypotheses which may or may not be true; and we are not led on by the evidence of facts to give an unavoidable assent to the propositions advanced.

The second chapter of the volume is a "criticism" of the commonly-received views on the subject of stimulants; and he begins by stating that "every rapidly-increased manifestation of mental activity from an external cause is ordinarily assumed to result from the action of a stimulus." That this manifestation of activity of mind is dependent on altered activity of brain is so self-evident, that we should not refer to it had not Dr. Anstie thought it necessary to state that the only action of a "mental stimulus," as he persists in calling substances which evoke this increased activity, can only act by making the brain, or some part of it, more or less efficient as an instrument of mind—overlooking the possibility of excitement of the organ of mind reacting on the mind itself—just as we know that pleasurable sensations tend to make one feel happy, and utter joyous expressions, and follow trains of pleasant ideas, which do not present themselves while the body is in pain. We do not think that our author has at all satisfactorily resolved any of these symptoms of excitement into "a partial and highly-peculiar paralysis of the brain." If we understand him aright, his position is that, inasmuch as "substances like ammonia, which are universally allowed to act as pure stimulants," do not evoke mental phenomena, all such manifestations, whether of excitement, mirth, depression, or stupor, are due to the narcotic properties of the so-called stimulant.

This is a most suggestive thought. Here again, we miss the power of observation and experiment, which should have worked out this new field of observation, and brought out the true relations of stimulants to brain and nerves. It is quite certain that ammonia, if it acts on the nervous system at all, influences some portion of it which it does not bring it into relation with the mind at all: it does not influence the "organ of thought." Brandy does influence this organ; but does it also act on that other portion of the nervous system on which the ammonia acts, or are their actions wholly different? Does the diffusible stimulus act on the sympathetic, while the alcoholic stimulant only influences the cerebro-spinal system?

We have long thought with our author that the idea of depression following stimulation was simply a mistake—that drunken stupidity is not the effect of the previous mirth—that sleep is not produced by the "recoil" from the stimulus of an opiate. It is strange that the influence due to the difference between the effect of a large dose and a small one should have been so much overlooked; but it has, no doubt, arisen from the circumstance that the evidences of "stimulation" and of "narcotism" generally follow each other in succession as any substance is gradually absorbed by which both series of actions may be developed. We are not quite prepared to say that there is "a radical difference, not merely one of degree, between the action of small and large doses." It does not seem to us to be greater than the difference between the purgative and diuretic action of certain salts in relation to dose; and in either case it is impossible to define the exact limit where the one influence ends and the other begins, because probably both are simultaneous. It is a very remarkable circumstance that alike in the preparations of alcohol and opium this double action is seen. Dr. Anstie adds some experiences recorded by others which seem to show that Indian hemp has somewhat similar actions, and the same is partly true of chloroform. Each of these, however, is distinguished by actions specially its own. Opium is our great sleep producer, chloroform our anæsthetic. Dr. Garrod says of Indian hemp that he had "never found any direct soporific effects" from it, but that "its action as an anodyne appears to be well established." Wine, in the language of the poet, makes the brain "conceptive" of all the bright fancies of creative genius, or it deadens its perceptions and ideas till man grovels on the level of the beast. And while we must not lose sight of this curious similarity with reference to the dose in which they are to be given, it is their special action and not their general character which regulates the selection of the particular remedy to be prescribed. We should not choose opium or chloroform or hashish when we wanted a decided stimulant, but wine or brandy; and we should use them in preference to ammonia when a brain stimulant was needed. Argue as we may, we cannot get rid of the fact that men always have so used the preparations of alcohol, and we believe always will do so, because they produce the desired effect: the quantity is not to be measured or weighed, but to be regulated by the stimulant action developed, and the absence of inebriation or narcotism.

We do not propose to analyse further the "criticism" of the existing "doctrine of stimulus," because we do not feel that our author has stated the case quite fairly. For example, when he says "all increased sensibility and all pain is referred to the action of a stimulus," his words imply that the increased faculty of receiving impressions which we know by the name of pain, and the impression itself which causes this sensation, are by other writers alike referred to the action of a stimulus. We do not know where any such statement is to be found; but in reading the chapters relating to stimulants, we have been constantly impressed with the want of a proper definition of the terms employed. We are ever at discord with our author when he uses indiscriminately such words as "stimulate," "excite," "irritate," &c., with their respective nouns, "stimulation," "irritation," &c.; still further when "stimulus" and "stimulant" are taken as being absolutely synonymous.

In his third chapter, Dr. Anstie attempts a reconstruction of the "doctrine of stimulus." This part of the work is full of original thought and suggestive ideas. It illustrates the treatment of various forms of disease in which the organism is in a depressed condition; it points out the uses which stimulants may subserve in common with other agencies in its restoration; it shows more in detail in some instances how unfavourable symptoms disappear under their employment; but of stimulation itself there is not one word, no idea even suggested of the *modus operandi* when benefit results, except, indeed, we are to accept the theory propounded in the general conclusions, that stimulants act as "food":

> "It appears to me that the proposal to class stimulants, at least provisionally, as a special variety of food, is not devoid of rationality. Insomuch as they conserve the life of the organism not by substituting abnormal for normal action in the principal organs, but by restoring their natural functions, they seem to me to fill the *rôle* of aliments as completely in appropriate circumstances as do those substances to which the name of food is ordinarily given. The opponents of this view would be perfectly justified in rejecting it, if they could render any intelligible account of the doctrine of stimulus. They have failed to do this. The doctrine of stimulus, as at present taught in class-books, is the mere relic of an ancient doctrine which has no meaning now for the teachers any more than for their audience, and should be suppressed as a positive impediment to progress." (p. 274.)

The argument in favour of this view is grounded chiefly on analogy of the sustaining powers of some substances which are acknowledged to act on the economy as stimulants. All, however, of those enumerated as useful to support the organism in the absence of ordinary food happen to be narcotics, though generally believed to be stimulant in small doses. The link which ought to unite the stimulation with the sustentation has not been found, and we are quite justified in assuming, so far as the argument goes, that it is the narcotic influence of the small dose which is called its "supporting" power, and not its stimulant action. If it be true that ammonia is a pure stimulant, without any narcotic power at all, and ammonia will not sustain the organism in the absence of food, is it not, to say the least, probable that brandy owes this power to something else than its stimulant properties? It seems to us not irrational to suppose that alcohol acts on different parts of the nervous system in producing the two classes of effects, and that they may, therefore, be going on simultaneously, even although the one series is mainly developed when a small dose has been administered, and the other series acquires such prominence and importance when a large amount has been taken; but we are aware that this view does not exactly chime in with any recognised theory.

In the whole of this chapter, our author reasons very much from means to ends; but unfortunately he has selected the ultimate issue, health, as the index of the influence supposed to be exercised by the means employed. It is perfectly true that restoration to health is the final object we all have in view in the treatment of disease, and his suggestions are consequently of great interest; but in tracing out the actions of remedies, it is surely inadvisable to select the compound effect of all the variety of causes which are in constant operation as the test of their powers. This unphilosophical mode of reasoning first appears in the former chapter, where, for the purpose of analysing the action of stimulants, he selects the sensation of pain, and, for the sake of *simplicity*, chooses the pain of neuralgia. The very name by which we conceal our utter ignorance of the whole disease should have served as a warning that, in a scientific argument, the so-called "pain of nerve" ought to be sedulously avoided. A stimulant, a narcotic, a depressant, a purgative, may each in their turn relieve the pain of neuralgia; and therefore we learn nothing by being told that one of the effects of a stimulant is the "relief of pain."

Another action is supposed to be the "removal of muscular spasm, tremor, or convulsion." A third, "reduction of undue frequency of the circulation." It is perfectly true that occasionally an epileptic attack may be staved off for a time by a stimulant; but no one would be prepared to say that in all cases of "spasm, tremor, or convulsion," stimulation was called for, unless he knew what was the cause of the irregular action. Similarly, a quickened circulation, when the result of want of power, will be reduced in frequency by stimulants; but when accompanied by hot skin, bounding pulse, flushed face, violent headache, no one in his senses would order brandy. This appears to us to be one great error into which Dr. Anstie has fallen, and it must in a great measure vitiate all his conclusions. For example, as he lays it down that the relief of pain is due to "stimulation," he goes on to assert that two grains of opium act as a stimulant, and that when a third of a grain of morphia is given every three or four hours to relieve the pain of pleurisy, it is the stimulant action, not the anodyne, on which we rely. To this conclusion we must positively demur.

If we now turn to the second portion of the work, which is devoted to the consideration of narcotics, we find under the head of ' Definition of Narcosis" the following statement:

"Narcosis proper may be described as a physiological process, in which the nervous system is deprived, by the agency of a poisoned blood-supply, of its vital characteristics with greater or less rapidity, and which directly tends to produce general death of the organism by means of such deprivation. Its varieties may be considered as dependent upon the order in which the devitalizing power affects the various portions of the nervous system, and the comparative violence with which it injures them respectively." (p. 173.)

"Narcosis may be, therefore, understood to be no less than the severance of the copula of life—a severance partial or complete according as it cuts through some mere solitary border-path, or the busy cross-roads of the ways of life; that is, according as it touches some outlying nerve only, or poisons the great centres through which they all communicate—partial or complete, too, according as it partly obstructs or wholly closes up these paths of dynamic influence. It is, in fact, a more or less complete paralysis of the nervous system." (p. 174.)

"Upon this portion of the organism [the nervous system] narcotics of every kind exert a continuously devitalizing power." (p. 258.)

We are unable from the work to gather any other definition of the action of narcotic remedies. This statement is equally true of any disease in which brain symptoms are present, and specially true of those in which, to use the phraseology of Bichat, death begins at the head. It is true of every substance which acts on the nervous system in such a way as possibly to cause death, but it gives no idea of what a narcotic *remedy* is, or how it acts, or why it is prescribed. Dr. Anstie seems to have taken the instance of "acute opium-poisoning" (p. 176 et seq.) as the groundwork of his description of the "symptoms of narcosis." Having noted down all the possible symptoms which may, and do *sometimes* attend a case of opium poisoning, he arranges these in groups according to the organs in which they are exhibited; and then he assumes that every substance which can excite similar actions is to be regarded as a narcotic. To this argument we object that it is not the action of narcotics as poisons, but as remedies, that we are most anxious to learn. The medical jurist must make himself acquainted with their poisonous qualities; the "busy practitioner" wants to know their medicinal uses. When an individual is poisoned, it is no longer possible to say which symptom is due to narcosis and which to the irregular and expiring energies of nature; but we are quite sure that symptoms which are not constant in their occurrence are not due to the presence of the drug in the system. It is well to know that spasm or convulsion may occur in a case of opium poisoning, especially in childhood, but the absence of these symptoms is the rule in the adult; and therefore we cannot allege that they are *caused* by the opium. Our author, however, not only assumes that they are direct evidences of narcosis, but he goes on to point out that in frogs and rats *occasionally* tetanic spasms are produced; and hence he concludes that strychnia, which always causes tetanic spasm, is a narcotic. We cannot subscribe to such arguments, or to such a change of nomenclature as their adoption involves. A drug which *always*, when given in sufficient dose, produces tetanic spasm—a spasm so intense that it may kill without in the least obscuring the organ of thought, ought not to be classed with one which *always* in sufficient quantity does stupify the brain, and may kill without one single spasm, tremor, or convulsion from beginning to end. To call both narcotics is only to produce confusion in the mind of the student. In therapeutics, the terms narcotic, sedative, hypnotic, anodyne, are only short and compendious names for certain actions developed in the living body by the presence of substances endowed with peculiar properties. A narcotic, for example, is that which blunts the sensation of pain either by rendering the nerve less capable of transmitting the impression, or the brain less capable of perceiving it; it does not in the least touch the cause of pain, or remove it. A true hypnotic is a substance which under any but very exceptional circumstances brings sleep, if the dose be sufficient, without any poisonous action, which is only the effect of an over-dose. The name does not apply to remedies which merely, in exceptional cases, procure sleep by the removal of pain, excitement, or any other cause of sleeplessness. A sedative, again, as we understand it, is neither one nor other; it does not stupify the brain, it does not induce sleep. Pure sedatives are perhaps best described as depressants; but the term has a wider signification, and includes remedies which do not depress, but have a soothing or quieting effect on particular organs.

This, we think, is the weakest part of Dr. Anstie's book; and as we cannot look upon two-grain doses of opium as "stimulant," so we cannot agree with the conclusion that the "narcotic" action of the drug "does not fall within the number of remedial agencies, properly speaking." We cannot take leave of this work without repeating that it bears the impress of deep thought and extensive observation, though we have felt bound to criticize the conclusions at which he has arrived, and to express our regret that its author has not worked out the problem in a more philosophical manner.

Dr. Fraser has limited himself to the consideration of the actions of the physostigma venenosum, or Calabar bean; but in describing its influence over the size of the pupil, he has been incidentally led to notice the operation of other remedies on the nervous system; and to this subject we would call attention for an instant. The fact of contraction and dilatation of the pupil by certain remedies is so well-known that it is impossible to avoid attempting an explanation of their action. The Calabar bean has the remarkable property of producing contraction of the pupil without any symptom of poisoning, such as attends the contraction caused by opium. Its *modus operandi* must therefore be somewhat different. Adopting Valentin's view of the arrangement of the ciliary muscle and the sources of its nervous supply, Dr. Fraser gives a table showing how various agents produce opposing results. He states that—

"The cerebral nervous filaments are distributed to the circular muscle, or *contractor* of the pupil, and the spinal to the radiating fibres or *dilator* of the pupil. . . . . A stimulus applied to the spinal filaments will occasion contraction of the radiating fibres and dilatation of the pupil; and a stimulus applied to the cerebral fibres will cause, through the circular fibres of the iris, contraction of the pupil. An agent producing an inverse effect on either system of nerves will in the same way produce an inverse result." (p. 14.)

"*Methods in which the size of the Pupil may be affected.*

"Two Cerebral.

"1. Cerebral irritation—*Contraction*, as with opium.

"2. Cerebral depression—*Dilatation*, as with belladonna, æthusa cynapium, hyoscyamus niger, alcohol, veratrum album.

"Two Spinal.

"3. Spinal irritation—*Dilatation*, as with strychnia.

"4. Spinal depression—*Contraction*, as with physostigma venenosum, aconitum napellus.

"Two Combined—Cerebral and Spinal.

"5. Cerebral irritation and spinal depression—*Contraction*, as with ruta graveolens.

"6. Cerebral depression and spinal irritation—*Dilatation*, as with cicuta virosa, nicotine, hydrocyanic acid, digitalis purpurea."

To all this we have only to object that it is far too theoretical; and if we rightly apprehend the subject, cerebral irritation is not proved of opium any more than special irritation is proved of digitalis: the remedies are made to adapt themselves to the theory, in place of the theory merely supplying the link to bind together acknowledged facts in therapeutics. We think no suggestion can be received with reference to this subject which does not take account of the distinction between the local influence which some of these substances exert and the change which is only remotely brought about by a more general action, generally of a poisonous kind, excited in the organism at large.

Dr. Fraser has made on the whole a very successful attempt at the solution of an obscure question; and till further trials have rendered us more familiar with the therapeutic uses of the Calabar bean, his thesis will serve as a guide to those who wish to study its action.

Dr. Garrod and Mr. Squire have each contributed monograms which are of great value as commentaries on the British Pharmacopœia. The 'Essentials of Materia Medica' had been the most acceptable text-book before its adaptation to the new Pharmacopœia, which has now made it almost an "essential" to the student in therapeutics. He has given under each remedy its commonly received therapeutical action, but he does not hesitate to express his doubts when his own observations have led him to different results. Mr. Squire has attempted to give a more exact idea of the composition of the "preparations" of the Pharmacopœia than can be obtained at once from the directions therein given, by stating the proportion in parts of each ingredient. Along with this he has combined a comparison of the various strengths of analogous preparations in the old Pharmacopœias and in foreign countries. The whole has been interwoven into a very valuable running commentary on the Pharmacopœia, with an account of the supposed action of each remedy in the economy, and the dose in which it is usually prescribed. We can honestly recommend this work to any "busy practitioner" who feels it necessary to acquire an insight into the new Pharmacopœia, which, as far as we are informed, has hardly been adopted by any who were in practice prior to its publication.

PART SECOND.

Bibliographical Record.

Art. I. — *The Principles and Methods of Medical Observation and Research, for the Use of Advanced Students and Junior Practitioners: with copious Nosologies and Indexes of Fever, and of Constitutional, Cutaneous, Nervous, and Mental Diseases.* By Thomas Laycock, M.D., F.R.S.E., &c., Professor of the Practice of Medicine, &c., in the University of Edinburgh. Second Edition.—*Edinburgh*, 1864. pp. 403.

Our notice of the first edition of this work, partly in approval, and only partly, ended with the expression of opinion, "that with much that is sound and good, the book contains much that is questionable (to say the least), and would have probably attained a far more perfect development, had its period of incubation been two or three years instead of two or three months." That edition was published in 1856, so that there has since then been ample time for amendment and correction; but judging from the preface, it would appear that its author has seen it necessary to make but few alterations; whilst he has made great additions, the present volume being nearly double the size of its predecessor. The additions mainly consist of a new part, comprised in one hundred and fifty pages, and consisting of nosologies and indexes of fevers and other diseases, according with, as he informs us, his method of professional teaching.

After a somewhat careful perusal, we regret to say that our opinion regarding the merits of the work, in its enlarged form, is as much divided and qualified as that expressed in the summary manner already adverted to. In our first notice, the grounds of our objections were candidly and pretty fully stated. We need not repeat them. Besides the objections then made, some others have occurred to us in reading this second edition. In the first place, we doubt very much whether the character of the work is suitable to those to whom it was and is addressed—"advanced students and junior practitioners." What should we say of a professor of chemistry giving a course of lectures after the manner of these lectures of Professor Laycock? Should we not be disposed to consider them out of time and place, and altogether supererogatory? What students are most desirous of being instructed in, and what they most need, is not so much the logic and methods of a science, the principles of its nomenclature and arrangements, as the knowledge of the body of facts systematically arranged, which constitute it a science. In the next place, we doubt much that Professor Laycock's method, as a whole, is even well adapted to convey the instruction which he is desirous of giving. He seems to us to be often too transcendental in his views, too hypothetical in his reasoning, and too refined and fanciful in his analogies. We apprehend in consequence that what he has written is more likely to unsettle and perplex the mind of the student than to serve as a safe guide to practice and ulterior research. Indeed, as to ulterior research, it is well to remember how small is the number of men in any profession who are addicted to original inquiry—how few those are who make discoveries in any science, and that these are invariably gifted individuals, in a manner self-instructed, and on whom such instruction as Professor Laycock affords, would be wasted. It is well too to remember that the great majority of the medical profession must be occupied in the ordinary duties of their calling, and that the only way in which we may expect them to contribute to the advancement of medicine as a science, is by recording and publishing any new facts which they may meet with in their practice, encouraging themselves with the hope that by such helps, small as they may appear, progress is made. Further, it is well to keep in mind who are those to whom medicine is most indebted. Harvey and John Hunter may be considered as examples of them, and they, like all the rest of its greatest benefactors, were more distinguished for originality, for that which constitutes genius, and for industry, its fitting accompaniment, than for profundity and variety of book knowledge.

Professor Laycock lays much stress on the analogical method of research. In our former notice we have pointed out some of the dangers to which this method is exposed. No one who reflects on the subject but must be aware of the abuses to which it is open, the fallacies it may engender, and the great caution that is required in its use. We are disposed to think, at the present time, that the student would stand more indebted to his teacher for pointing out to him differences rather than analogies—the one most important practically, the other, with homologies, most important theoretically. Theoretically viewed as a mucous membrane, the large and small intestines should be subject to the same morbid actions and changes; dysenteric inflammation and ulceration should not be confined to the former, nor should perforating ulcer be more frequent in the latter. It seems to us a mistake, viewing medicine as a practical art, to attempt, after Professor Laycock's method, to found a system on transcendental views resting on embryology and the dictum of "the unity of structure and function of organisms in time and space," which our author calls "the primary and fundamental principle of life," and offers, as a practical test by which what are "analogous" may be distinguished from the "similar." We quote the passage in which this dictum occurs:

"*Relations of Theory to the Analogical Method.*—In the first place, let me explain to you what a theory is in the working of this method. Having your observations before you in their individual relations, or in a generalized form (either numerical or not, according to circumstances), you proceed to compare them, and tabulate them, as it were, according to their resemblances or differences. The proper result of this process of tabulation and comparison is the discovery of an analogy, and the phenomena so treated are analogous. The comparison may lead to a generalization sufficiently definite to constitute in itself a unity of phenomena. Thus you compare all the facts known as to a certain class of remedies—e.g., the inhaled and anæsthetic gases, and you find that they have in common two things—1st, the property of modifying the nervous system when brought into contact with it, so as to alter or abolish sensorial sensibility; 2ndly, that they are all compounded of the same two elements, carbon, and hydrogen. They are, therefore, analogous in their composition, and analogous in their effects. The result is, however, simply a general impression of facts, corresponding to the results of a primary numerical tabulation, or to a simple fact of experience. *Why* these compounds of hydrogen and carbon should thus act under given circumstances is not at all shown. To determine this question of causation, analogous phenomena manifested under analogous circumstances in analogous structures, would have to be compared, and the order of their occurrence investigated; in other words, experimental research would have to be instituted. But how would you determine which were analogous? By the aid of the great fundamental principle of life—the principle of unity of structure and function. This would enable you to compare general facts, and see which were analogous and which were only similar. Then a general exposition of them in relation to each other would constitute its theory. This general exposition would theoretically assume individual facts and details to be either probable or true, not yet observed or investigated experimentally."

He presently adds, "It hardly needs any comments to show how necessary the most thorough physiological and pathological knowledge is to this method of research." Were we to criticise the example thus given, we might point out how it might seem to illustrate the danger of this kind of reasoning, and how agents differently compounded may be productive of analogous effects, carbonic acid being anæsthetic, as well as certain hydrocarbons. And as to the dictum of unity of structure and function, announced as a fundamental principle, do we not see many exceptions to it, especially in the lower grades of life, in which, e.g., aëration, so essential to life, is effected by no special structure in creatures in the conformation of which the principle of the differentiation of organs is hardly rudimentary?

Professor Laycock justly lays stress on the importance of using instrumental aids in the investigation of disease; and yet in another place he expresses the opinion, that medical tact is the *sine quâ non* of the accomplished physician:

"Experienced tact," he says, "never analyses, never spells the symptom-letters, or stops at the pathognomonic words, but reads off the case at once the moment that the whole of the characters become cognisant to the perception. This is the reason why in intuitive diagnosis so few physicians are able to give the grounds of their decision. They are not conscious of the individual elements; no more, in fact, than any man is conscious of the multitudinous points or parts in any merely visual objects of which he becomes cognisant, as a book or a chair. It is only the great salient marking-points that strike the eye, as the angles and sides of the book, or the seat, legs, back of the chair. What you need, then, for the acquisition of this intuitive sagacity in the perception of disease is a familiarity with morbid states, having leading characteristics, so that an opportunity is afforded to the mind of instinctively arranging into the proper words and sentences, or into the evolved outlines, if the metaphor may be permitted, all these minute and separately inappreciable phenomena which reach the consciousness rather as *results* than as *objects* of thought. Then, when afterwards one or two of these leading characteristics are seen, all the rest, although not seen, are known to be there; just as a single word may be read easily, although all the vowels be left out."

We quote the above, as we hold it to be dangerous doctrine, and a doctrine we should little have expected from one who holds that diseases cannot be viewed as species, but merely as series of events or phenomena, and these not well-defined—so ill-defined, indeed, that according to a maxim in practice which he names, "no two medical cases are alike." For our part, we should have but a poor opinion of the practitioner who is unable to assign a reason for his belief—the grounds of diagnosis in any important case about which his opinion might be asked in consultation.

Too frequently we meet in these pages with passages which do not harmonize, and which, moreover, one or other, are open to objection. Thus, whilst the author considers the science of physiology the main foundation of the science of pathology, and that the skill of the practitioner will accord with his knowledge of the sciences, which knowledge, he says, should be profound, he elsewhere gives us to understand that the state of each of them is still too imperfect so to be used, and that experience is all in all.

One of Professor Laycock's doctrines is, what will be held by many as a truism, that "no true theory is possible without science," adding as a commentary:

"Now, disease may be simply defined to be a deviation from the normal state, either of structure or function, or both. To know this deviation to the full extent—that is to say, its origin or causes, its nature, its course, and its remedy—implies, at least, a knowledge of healthy function and structure, or the science of physiology, of the agents which cause deviation from the normal state, or etiology, and the mode in which these agents act, or pathology. All recorded theories and general terms, and all your conclusions will, therefore, be applicable and complete only in proportion as they are founded upon this knowledge. Hence your estimate of theories, as well as your power to comprehend and control disease, will depend upon the amount of your physiological, pathological, and etiological knowledge. In proportion as this is extensive and accurate, will you be successful as practitioners and investigators. Hence knowledge is synonymous with power; and in this respect, a junior medical student of the present day is far superior to a Hippocrates or a Sydenham."

Here, indeed, is a great demand on the faculties and attainments of the student, so great, that if the words were to make a due impression, we very much fear that a large proportion of Professor Laycock's class would hold themselves incompetent to enter a profession with such heavy responsibilities, and would be disposed to echo the words with which the first lecture concludes, the well-known aphorism of

Hippocrates, "Life is short, art is long, opportunity fugitive, experience deceptive, judgment difficult;" and that whether junior or advanced students, they may, if they have any modesty, well doubt of their being in possession of ability or power superior to that of the Greek or English physician named.

The very general and the vague, in the treatment of any subject, seem almost unavoidably associated. We have an instance of it in the manner in which Professor Laycock discusses "Diatheses," under the head of "Clinical Observation of General or Constitutional Morbid States." By the term, he says, is meant "such an innate, hereditary constitution of the body, that in the course of the vital actions there will arise, at various periods of life, under varying circumstances, local or general diseases having a common resemblance, either as to etiology, symptomatology, or pathological anatomy." Adding, "This may be shown in disorder of a general process, of which the nutrient derangements characteristic of the strumous and arthritic diathesis is an illustration; or, in disease of a special tissue, as in the nervous or rheumatic diatheses." He names five diatheses as hereditary, the arthritic, strumous, nervous, bilious, and lymphatic. Of these, he says, the latter are the least prevalent in the United Kingdom, and are by no means so well marked as the others. He further remarks, "All these combine variously with each other, and composite diatheses result. Each diathesis is a unity; that is to say, the external configuration and every function are in harmony, and so constitute a whole." Adding:

"To diagnose a diathesis, we select such general characteristics as are easily observable. Of this kind are the colour of the blood, as seen through the capillaries; the development of the heart and vascular system; the conformation of the bones and muscles; the features; the form of the trunk and limbs; the condition of the teeth, and hair, and skin; the state of nutrition; the activity of function; the amount of vital energy, and the mental character."

If the definition is general and vague, here in particular we have more than enough of what, as regards points of inquiry, is precise—constituting a research that may well test the patience and ability of the most patient and able practitioner. And how open is the whole to criticism. Taking only the first named, the colour of the blood as seen through the capillaries, what reliance, we would ask, can be placed on it as to the true quality of the blood, that of itself an extremely difficult subject in the way of pathological appreciation, reminding us of the saying of a distinguished German physiologist, that he was incompetent for such a task till after a study of the blood prolonged for two or three years. Of the several diatheses, we select one for a few words of remark—"the sanguine arthritic." Its physiognomy is thus described in its "sthenic form:"

"Bloodvessels numerous; heart large and powerful; blood-corpuscles numerous; skin over molar bones highly vascular, giving a floridness to the complexion; skin fair, firm, oleaginous, perspirable; eyes blue; hair thick, not falling easily; teeth massive, well enamelled, regular, even, undecayed in advanced life; malar bones flattened; head symmetrical; nasal bones well formed; lower jaw massy; lips symmetrical.

"*Form.*—Figure, for the most part, tall; thorax broad at summit; ribs well curved; abdomen full; muscles firm, large; limbs large, robust; gait erect, well poised. *Nutrition* active; digestion vigorous; appetite great for animal food and alcoholic stimulants. *Respiration* deliberate, deep; circulation vigorous; animal heat abundant; locomotion active; aptitude for exercise or out-door amusements. *Reproductive* powers active; innervation abundant; the mental powers vigorous and enduring. This diathesis tends to prolong life: it is therefore seen often after forty.

"The *predisposition* to disease in the arthritic diathesis may be *general*, and consist in the retention of urea in the blood, or in its too rapid production; or *local*, and consist in inflammation and inflammatory irritation of the product of the serous layer of the embryo, ending in calcification or bony change. When the retention of the urea is associated with a depraved blood-crasis, or with visceral disease, especially of the kidneys, liver, and heart, the arthritic *cachexia* is developed."

It may well be asked, Does not the above physiognomy apply to man of the most normal and healthy structure; and may we not say that in locating gouty action, inflammation and irritation in the "serous layer of the embryo, ending in calcification or bony change," we have an instance of Professor Laycock's tendency to indulge in the transcendental. Considering how partial gout is, how commonly it is produced by luxurious living and an indolent life, and how it is almost unknown amongst the natives of the larger portion of the earth, the propriety of propounding such a diathesis seems very questionable. In the description of the physiognomy of this diathesis, we have proof of what we consider an attempt at over-precision, following what we before held to be too general and vague. In description of the aspects of the other diatheses and their complications there are examples of the same kind, in reading some of which we could hardly refrain from a smile; as, for instance, when a "back-tooth"—that is, a tooth thrust out of its rank in the lower jaw—is noticed as one of the marks of the "adipose *depositive* form of asthenic arthritic diathesis and cachexia."

In his preface, Professor Laycock particularly calls attention to his classification of fevers and of diseases generally. It is preceded by some remarks to the effect that the naming and classification are necessarily coincident, and that in giving a name to a thing, the first mental act is to distinguish or differentiate it from every other thing; but this, he says,

"implies the process of comparison, whereby we determine in what qualities it resembles, or in what it differs from other things. When we find it differ wholly from other things, it is a new thing, and requires a name and place apart. When it resembles other things in general, it is classed under the same general name as those other things. If, however, it is found to differ in some particulars from these things which it resembles generally, then the general or generic name is modified or changed into a specific name. It is thus that the processes of generalization and comparison enter into the naming of anything whatever."

All this is very just, though not new, as are his observations generally on nomenclature. The latter, with those on classification, which are always ingenious, are deserving of a careful perusal, but not, we would say, of the student or the junior practitioner: rather of the medical philosopher.

The basis of the classification which Professor Laycock has adopted is not that which we might infer he would have chosen from his introductory remarks, inasmuch as it is etiological—the hidden rather than the obvious, the inferential rather than the known. In his General Nosology, his first class is Pyretic diseases—Pyrexiæ—General diseases characterized by a morbid evolution of heat in tissues or organs generally. First order—Fevers, *Febres; Seat*, primarily in the blood, the capillaries, and the vaso-motor nerve-centres, or in subdivisions thereof. Of these local pyretic changes take place, not necessarily structural. Then follows an "Etiological Nosology and Index of Fevers," which, irrespective of its resting on a basis of causes, we cannot but think is too complicated and involved to be practically useful. To criticize this portion of Dr. Laycock's work would require more space than we have at command.

We have given the book credit for much that is sound; there is in it too much that is ingenious and subtle. The following quotation is a fair example of the best parts, such as are most likely to recommend it to the notice of the reflecting and philosophical reader. The passage is introductory to "The naming and classification of diseases of the nervous system:"—

"In all vital processes, as in the phenomena of the universe, there is manifested an adaptation to ends. This teleological law is a fundamental law of life, and the power of adaptation a property of living matter. The adaptation to ends in creation, and the conscious and knowing exercise by man of his body and limbs to the attainment of ends, are both attributed to an agent termed mind. I have, therefore, named the vital force which correlates the teleological law, *Mind-force*. In accordance with the fundamental law of development of living things, whereby the special rises out of the general, this general teleological property of living matter is specialized and manifested in higher organisms, in a particular tissue made up of cells and connecting fibrils; and this is differentiated into a combination of systems or organs termed the nervous system. The correlative teleological force is termed *vis nervosa*. By means of this *vis nervosa* the nervous system acts on the tissues and organs of the body in general, and on its own constituent elements, so that their functional activity and the whole of the vital processes are adapted to ends. It acts in attaining this adaptation in a threefold manner; it excites and stimulates; controls and restrains, or 'inhibits;' guides and regulates. The teleological force thus operating in tissues is termed the *vis medicatrix* and 'nature;' in viscera and organs, the *vis conservatrix;* in limbs and natural weapons, *instinct;* in rational actions, feeling, and thought, the *mind* or *soul*. Following the law of differentiation and evolution, the nervous system is evolved into subordinate 'systems,' and attains its most complete development in the organs of the human mind."

The motto, "*Nullius in verba magistri*," has done good service. It deserves to be specially kept in mind in forming an opinion of the works of men who hold positions of eminence, such as those of professors in our universities. Whilst all respect is due to them, it is a duty not to ignore whatever in their publications detracts from their usefulness. In such a spirit have we briefly commented on the book now before us. Had it been addressed to the profession at large, with the omission of the more elementary parts, and not to students, we could have honestly offered more commendation than we feel now at liberty to bestow.

ART. II.—*Military Surgery.* By GEORGE WILLIAMSON, M.D., Surgeon-Major 64th Regiment.—*London,* 1863. pp. 250.

THIS is a new edition, or rather a remodelling, of a contribution to military surgery, which we noticed with approbation, on its first appearance, in our number for January, 1860, vol. xxv. p. 133. We are glad to see that the author has taken the advice which we then gave, and has thrown his cases into a form in which they are more accessible, by adding a table of contents and index, without which such collections are almost useless. If Dr. Williamson had also given some reasonable care to the correction of the press, the work would have been more creditable to him in a literary point of view. The very first sentence of the preface is so long that its author seems to have forgotten to finish it, and it is quite unintelligible and ungrammatical; nor are equally gross clerical errors wanting on almost every page of the book: but these are minor matters. The cases are of great interest, often very sufficiently related (although, as must happen in a collection from the notes of various reporters, others are very meagre), and many of them are illustrated by drawings of great beauty and fidelity. The book is not, as its title might seem to indicate, a systematic treatise on military surgery, but consists of some general remarks on the surgery of gunshot wounds in the various regions of the body, followed by illustrative cases from the records of the Crimean and Indian wars, and from the museum at Netley. The remarks do not, perhaps, deserve much credit for completeness or originality, but they are sensible and practical; the directions for operating might have been spared, as they are neither very minute nor always very correct; the interest of the book, however, lies in its illustrative cases. Among those of chief importance we may mention a successful case of trephining for inflammation below the cranium, in which the "puffy tumour of Pott" was observed and used as an indication for the seat of operation (p. 16); a case of extensive laceration of the brain, with no immediate symptoms (p. 36); a case of penetration of the base of the skull by a cane in fencing (one of a class now tolerably well understood) (p. 53); a case in which the patient survived for twenty-two years the penetration of the diaphragm by a gunshot wound, allowing of the formation of phrenic hernia (p. 92); a case in which a lance wound of the heart, slicing a piece out of the heart and passing into the liver, was followed by complete union, the patient dying five months afterwards of pneumonia, probably unconnected with the injury (p. 99); a case of recovery from a gunshot wound, which had perforated numerous coils of the small intestine (p. 111); a drawing of the perforation described by Mr. Guthrie, in which a ball had passed between the femoral artery and veins, not wounding either vessel, but causing coagulation in both, and consequent gangrene (Pl. IX. fig. 3); and finally, some information on the excision of joints, which embodies, as we believe, the most recent experience of English military surgeons as to the possibility of preserving limbs after gunshot wound of each of the principal joints. Along with these is Dr. Williamson's well-known case of successful excision of the bones composing the elbow, and a sequestrum of the whole shaft of the ulna (p. 27, Pl. X.). This case, being one in which the operation was performed on account of disease, is perhaps not very strictly in place here; but it is one of such great interest that we cannot complain of its insertion. As the patient has since died of phthisis, it is to be regretted that the arm was not submitted to careful dissection and preparation.

We only give them as a sample of Dr. Williamson's very interesting notes, which we can cordially recommend to the study of our surgical readers.

ART. III.—*Glaucoma and its Cure by Iridectomy; being Four Lectures delivered at the Middlesex Hospital.* By J. SOELBERG WELLS, Ophthalmic Surgeon to, and Lecturer on Ophthalmic Surgery at the Hospital.—*London,* 1864. pp. 86.

As usual, the iridectomy controversy is the old story of the shield with the gold and silver linings, or the chameleon of the fable. Each knight, each traveller, is confident in his own views, and even Mr. Bowman warms up and is eager as well as earnest. The latter he always is, and he may well be the former on this subject, for never since Mr. Bowman was old enough to read Zinn 'De Oculi,' or to dissect an eye, has so important an opportunity arisen for removing an opprobrium from ophthalmic surgery, and for benefiting humanity at large, as by giving iridectomy its true value and position in the treatment of glaucoma.

That a great, and at present an irreconcilable difference exists between the two sides no one doubts, that each has much to say for its own views, and fairly so, is likewise true; but while on the one side the treatment of glaucoma by iridectomy has been seriously jeopardized by indiscriminate operations, on the other, the support afforded to the non-operative treatment has been weakened by the testimony of men incompetent to diagnose and unable to operate.

In this controversy the postulates of the problem have never, perhaps, been clearly defined, and certainly not fairly accepted, and therefore a vast deal of argument has been wasted, and much bad logic displayed. What is glaucoma? What is not glaucoma? Does iridectomy cure it? How does iridectomy cure it?

For a clear, simple exposition of this very important subject, and for a solution of three out of four of these questions, we ask attention to the lectures just published by Mr. Soelberg Wells, 'On Glaucoma, and its

Cure by Iridectomy.' He does not profess to treat the subject exhaustively, but he places it before his class in a shape well adapted to their comprehension, and for this same reason also well suited to those of mature age who so largely swell the ranks of the opposition; men to whom the exigencies of practice render it well nigh impossible to keep their anatomical and physiological knowledge up to the level of existing discoveries.

He is a firm believer in, and advocate of, iridectomy as a cure for glaucoma, under certain conditions. He is equally clear and decided against the universality of its adoption, and points out most distinctly where it may not, as well as where it may be used with advantage.

We have seen a good many cases in our time of hopeless glaucoma; they are far more frequent than is generally supposed, disguised as they are under various and sometimes fanciful names. We have had to witness the slow, certain march of this disease, every now and then buoying the patient up with false hopes only to drop him into deeper despair, or lending a false, temporary lustre to the mendacious promises of impudent quackery; and we should be false to the progressive character of our art and recreant to its ultimate object of alleviating suffering, if we failed to recognise the real value of iridectomy, and to see in its *early* application the most hopeful means of arresting glaucoma that has yet been presented.

One, perhaps, of the most remarkable features of iridectomy is the rapid, almost immediate, subsidence of the intense constitutional disturbance produced by acute inflammatory glaucoma. We have seen the vomiting, the fever, the distressing neuroses, the agonizing nocturnal pains, all disappear as if by magic, after an iridectomy.

It is hardly too much to say that, but for the ophthalmoscope, we should not have had iridectomy; and herein lies one of the causes of opposition. Some of the opponents are among those who know how to use and how to interpret the revelations of the ophthalmoscope, but to very many its manipulation is impossible, because they have not sought to understand it. It really carries one back to days when the stethoscope was abused, when its advocates were accused of setting up an idol of wood, and histology and microscopical investigations were pooh-poohed. No man is competent to diagnose or prognose a case of glaucoma, who cannot make and read correctly the results of ophthalmoscopic examinations. It is not within the limits of this paper to quote as freely from Mr. Wells's 'Lectures' as we could wish; but we regret this the less, because he has worked his subject into so compact and readable a form as to make it an easy as well as short perusal; and he has so fairly balanced both sides that we will leave no excuse for not reading all four lectures, by quoting much from any one. We will only extract the following:

"Some opposers of the operation have apparently thought that its supporters claimed for it the power of restoring sight in all cases of glaucoma, whatever their stage or nature might be. But none of its advocates have ever done this; they have only upheld its curative powers in these cases in which irreparable changes in the structure of the eye had not yet taken place. The extent of the benefit which may be expected from iridectomy will, therefore, depend upon the stage and form of the disease in which it is had recourse to. It may be laid down as an axiom, that the sooner the operation is performed when the premonitory symptoms have become marked and frequent, or after the outbreak of the disease, the better; so that the affection has not yet had time to produce material changes in the structure of the organ." p. 63.

We agree in every letter of this extract; we have seen the operation done too late, never too early.

There is what at first sight appears to be an omission in Mr. Wells' lecture, and on which hostile critics are likely to fix—viz., that he gives no explanation of the *modus operandi* of iridectomy in the cure of glaucoma. As the man in the 'Critic' explains that the "Spanish Armada cannot be seen because it is not in sight," so, as the precise action of iridectomy is yet uncertain, Mr. Wells wisely and modestly bides his time till further and deeper investigations shall disclose the process. While denying that it is the division of the ciliary muscle which effects the cure, as has been so roundly asserted, he declines to weaken the real value of the papers by unproved hypotheses, be they ever so tempting. Some day, the minute dissection of eyes that have undergone iridectomy will disclose the process. Meanwhile we know that nothing better, nothing so good, for the relief of glaucoma, has been discovered, as iridectomy.

In conclusion, we cannot but remark on the fairness and moderation, and the absence of partisanship, Mr. Wells has shown. As an earnest and rising ophthalmologist, he might have been excused if he had cited more freely Moorfields and Berlin, Von Graefe and Bowman, his teachers and friends, and pointed more markedly to what they have done and are doing; but he has too much confidence in the intrinsic value of the process to overlay it, and he has wisely declined to follow the example of its opponents, who condemn it because it is not of them, and who would say, "Hors de nous et nos amis, point de salut."

ART. IV.—*Du Strabisme et spécialement des Conditions de Succès de la Strabotomie.* Par EDOUARD MEYER.—*Paris*, 1863.

On Strabismus, and especially on the Conditions of Success of the Operation for its relief. By Dr. E. MEYER.—pp. 112, with plates.

THE special subject of this work, the conditions of a successful operation for squint, can scarcely fail to interest the surgeon; for, on the one hand, cases of strabismus are of frequent occurrence, and on the other, if the treatment is to be followed by a perfect recovery, it must be carried out with the greatest care and intelligence. No doubt it is easy to perform the ordinary operation, and we have no difficulty in believing that the result is all that can be desired in many of the cases so treated. Yet as some squints are slight and some severe, as sometimes the affected eye is amaurotic, sometimes almost normal, it is evident that the same operation cannot invariably answer. It has, however, been recently shown how the treatment may be modified so as to produce a greater or less change in the position of the eye; and it has also been recently proved that a certain proportion of patients can only be treated successfully by an entirely different operation. A full exposition of the best methods of treating strabismus cannot therefore fail to be useful.

There is some reason to believe that the celebrated Taylor, the wandering oculist who made so much noise throughout Europe during the earlier part of last century, had already some idea of dividing the internal rectus, but no satisfactory account remains to show that he ever really performed such an operation. Dieffenbach was, however, the first who performed, in 1839, the division with a good effect; he did not, indeed, himself conceive the idea, but derived it from Stromeyer's well-known "Contributions to Operative Orthopœdics." The report of his success was soon diffused in every direction, the consequence being that for some time the operation became quite fashionable. After a time, however, it became generally admitted, that although in many cases, perhaps the mass, very satisfactory results were gained, still a certain number were not cured, and some were rendered very much worse. Patients are still occasionally to be met with, on whom ten or twenty years ago the muscle was cut for a slight convergent strabismus, and who have ever since borne their testimony against the proceeding in the shape of a bulging and everted eye. As at that time it had not been rendered clear, why such was sometimes the deplorable effect, both surgeons and patients became frightened, and the operation was less and less frequently performed. It must also be remarked that in some cases the operation had no effect, the squint remaining exactly the same, and that in others the effect was not sufficient, the eye becoming somewhat straighter, but not perfectly so. All this has been changed since Professor A. von Graefe published in 1857 his memoir on strabismus in the 'Archiv für Ophthalmologie,' in which he explained the conditions of success; in that classical essay are to be found principles and rules for the application of the operation to different degrees of strabismus, and to its different forms, which have now been confirmed by their trial in some thousands of cases during the last few years.

Dr. Meyer, who has himself been a pupil of Von Graefe, has written his essay with the view of promulgating a knowledge of these important researches in France. We may at once remark, that we wish him every success; his essay is on the whole excellent, and may be read by the English surgeon with no less benefit than by his French *confrère*. The following brief account of some portions, which have appeared to us of more especial interest, may perhaps supply the place of the work to some, or induce others to examine the original for themselves.

Treatment by prisms.—Every one knows that a glass prism refracts a pencil of incident rays in such a manner that the emergent rays are deflected towards its base. Hence it results that if a prism with its base directed outwards is placed before one eye, the rays coming from any object will be deflected from their path, and will fall upon the outer side of the macula lutea in that eye. Double vision is thus produced, for on the one side the image is formed on the macula lutea, on the other to its outer side. The diplopia soon disappears again, if the prism is not too strong; and the cause of the recurrence of single vision will be found in a deviation inwards of the eye behind the prism; or in other words, in the formation of a convergent squint. The tendency to single vision has been sufficiently powerful to cause the internal rectus of that eye to contract with increased force. A corresponding result occurs if the base of the prism is directed inwards.

It is on this principle that the treatment of squint by means of prisms depends. Just as in the experiment related we produce an artificial strabismus by causing increased contraction of a single muscle; so following the same plan we may sometimes be able to cure an existing deviation by stimulating the opposite muscle to increased effort. The prism must then, of course, have its base directed towards the opposite side from that towards which is the deviation. Great care must always be used in deciding on the strength of the glass employed; if too strong, it would bring the deviated image to the macula lutea or even beyond, and thus exert no curative action, or even increase the squint; on the other hand, if too weak, it would render the diplopia still more irksome, and thus cause the affected muscle to contract still further, again augmenting the deviation. All idea of benefit from this method must also be abandoned, if it is found that a prism with an angle of more than twelve degrees is required. As, moreover, it becomes necessary to change the glass every eight days or so, even when everything is progressing favourably, for a lessened squint naturally demands a weaker prism, the treatment becomes very irksome to both the patient and the medical man. For these reasons we have ourselves rarely employed it; in the cases, however, where a slight deviation remained after the operation, it is sometimes very useful. A case related by our author may give a clearer idea of the method to be adopted, when the surgeon decides on a trial of such treatment. A young woman had been affected with a rheumatic paralysis of the rectus externus of the left eye; from this she recovered, but in the meantime the opposite muscle had become contracted, and caused a convergent strabismus. The flame of a candle, placed directly before her at a distance of six feet, appeared double, especially when a coloured plane glass was held before the healthy eye. The double images were direct, the right image belonging to the right eye, and there was a space of 15 centimetres between the two. A prism of twelve degrees, placed before the left eye, with its base directed outwards, instantly united the two images, without any effort on the part of the patient, and without producing any change in the strabismus. This prism was too strong; one of ten degrees brought the images within a few centimetres from one another, and then, by an effort of which the patient was quite conscious, the left eye moved and the images united; the squint was now slightly diminished, owing to the increased contraction of the external rectus. The patient was directed to practise with the prism at objects three or four metres distant. Eight days later, it was found that the double images were only twelve centimetres from one another, and that a prism of eight degrees was sufficiently strong; the squint was measured and found to be a little less. The fresh prism had a similar effect; the treatment was accordingly continued, weaker glasses being employed as the squint diminished. At the end of two months, the recovery was perfect; all diplopia had disappeared.

Treatment by operation.—The method employed by A. von Graefe differs somewhat from the older plan, according to which the tendon or the muscle was divided behind the hook (compare the account in Mackenzie's 'Treatise.') Such a change indeed was necessary, when the process, by which the wound of the tendon healed after division, had become more fully understood. It was formerly imagined that the two ends of the tendon again united by means of newly-formed tissue, and that thus the muscle became longer. But since Lucien Boyer first threw doubt on such a process, many observers have proved by the examination of the parts after death, or in second operations, that the two ends never reunite, and that the posterior portion becomes again connected only with the sclerotic; indeed, if the muscle is divided some distance back, its orbital portion is entirely and permanently separated from the eye. One result, therefore, of such an operation was to materially diminish the length of the muscle—an undesired and undesirable effect, for the muscle was obviously already too short. The indication accordingly was, to sufficiently modify the influence of the muscle over the position of the eye, but at the same time to diminish its length as little as possible; in fact, to alter the position of its insertion, for it is easily understood that it must exert less power after its insertion has been removed farther backwards, and *vice versâ*. Thus the present practice is, not to divide the muscle or tendon behind the hook, but merely to separate the tendon from the sclerotic, so as to allow the muscle to retract to the desired degree. One object in the ordinary operation for strabismus is, *to preserve as much as possible the original length of the muscle, but at the same time to remove its insertion a little backwards.*

The immediate effect of the operation performed in this manner on the internal rectus is, that the eye, in the adult, is directed four millimetres more outwards than before, or in the child nearly to six millimetres. Then comes the question of supreme importance—can we so modify the operation as to render the effect proportional to the degree of squint? Professor von Graefe has shown how this can be effected; thus, that by the use of the conjunctival suture, some of the subjacent cellular-tissue being included, the effect may be reduced to two millimetres, and by a partial tenotomy, three-fourths only of the insertion being separated, a deviation of only one millimetre may be corrected. On the other hand, an alteration of five millimetres may be produced by using a large hook and freely separating the connexions of the tendon from the sclerotic, and this may be augmented to six millimetres by the patient looking almost constantly during the two or three following days in the opposite direction, so as to keep the eye for some time forcibly rotated outwards. More can scarcely be effected with certainty or safety; should some deviation still remain, it must be rectified by an operation on the other eye. For example, the left eye of a patient squints inwards to the extent of eight millimetres; the deviation should be corrected to the extent of five millimetres by separation of the left internal rectus, and the treatment will be concluded by removing the insertion of the right internal rectus three millimetres backwards. In this way we may succeed by a simple and certain proceeding in curing the most extensive deviations, not only rendering the eyes, as it is said, straight, but also restoring their symmetry both in appearance and action.

It is at once clear that it is exceedingly important to determine with the greatest precision the degree of deviation before undertaking the operation. The author describes an ingenious instrument for this purpose, yet we must admit that we prefer the one invented by Mr. Laurence, which is not so complicated, and far less costly. The latter consists of an ivory plate, corresponding in shape to the curve of the lower eyelid, and marked with a scale of Paris lines and half lines, which count from the middle line (zero), either outwards or inwards. Mr. Laurence has also proposed a ready mode of noting the direction of the linear deviation; he uses a + sign for convergence, and a — sign for divergence, thus oc. dext. = 0, oc. sin. = + 2 would represent a convergent squint of the left eye of two lines.

As soon as the surgeon has separated the tendon to the proposed degree, he should test the effect, so as to satisfy himself that his object has been attained. The best criterion is the limitation of mobility in the direction of the separated tendon; thus, if the internal rectus has been divided, the patient should be able to turn the eye inwards only to a distance two or three millimetres less than what he could before the operation. Should there not be this muscular insufficiency, the tendon has not been completely detached; the hook must therefore be again introduced, and the scissors used a little more freely; in some rare cases it will be found that the muscle has a second insertion further back; the writer once met with one close to the equator of the globe, the division of which instantly produced the desired result. We do not find this circumstance mentioned by Dr. Meyer, although, if we remember correctly, Professor von Graefe has alluded to it in his paper. If we find that the degree of muscular insufficiency is greater than the amount mentioned, the conjunctival suture should be applied, even though the eye may appear perfectly in its proper position.

The ultimate effect is generally in cases of convergent strabismus identical with that found immediately after the operation; in divergent strabismus, however, the rule is that a constant and rather considerable diminution in the effect of the operation takes place during the period of healing. For this reason, a greater immediate change than the one finally desired should always be produced in the latter form of squint; not only must we correct the divergence, but also induce a convergence of one or two millimetres, which will be certain to disappear during cicatrization. It must also be remarked, that separation of the external rectus usually causes a much less change of position than that induced by the corresponding operation on the inner side.

One objection urged against this method is, that the caruncula lacrymalis is very liable to recede from its natural position. Dr. Meyer states, that Professor von Graefe has often succeeded in rectifying this mishap by a trifling secondary operation; dissecting up the conjunctiva from the outer side of the muscle, and uniting the parts by suture in such a way as to again drag the caruncle forwards.

It not uncommonly happens that, although the operation is in every sense successful, the patient still persists in holding his head awry. Such a posture may be corrected by the use of proper goggles. For example, he keeps his head turned towards the right side, goggles provided with an opening on the nasal side for the left eye, and on the temporal for the right eye will be required. The patient, for the purpose of finding an object, or if walking, will be obliged to turn his head towards the left side, in order to see directly before him; a little practice in this way will soon change the position of the head.

So far we have had in view only the more common form of squint, the concomitant, which depends upon the permanent contraction of one or more muscles. We have, indeed, already mentioned as one disastrous effect of the older operation, that the eye sometimes became deviated in the opposite direction, when the insertion was thrown too far back, or when the muscle did not form a fresh attachment to the sclerotic. The patient was then unable to turn the eye in the direction of the divided muscle; the opposite rectus gradually contracted and produced a fresh strabismus, *a secondary strabismus.*

The treatment of such a secondary squint must vary according to the muscular insufficiency produced; if the latter is only slight, not more, indeed, than five or six millimetres, and if, at the same time, there is no divergence when the patient fixes an object directly before him but placed at some distance, tenotomy of the external rectus will restore the symmetry of the two eyes. Should there be, indeed, slight divergence, tenotomy performed on both eyes may answer. Such treatment would, however, be of no avail, when the divided muscle had lost all, or almost all, its influence over the eye. Our object must then be to bring forward the remains of the muscle, so as to enable it to act efficiently on the position of the globe. Jules Guérin first attempted to fulfil this indication; after having divided the conjunctiva and fascia, he sought for the remains of the internal rectus, and with this design bared the sclerotic, and carefully separated the retracted muscle by a minute dissection from all its cellular and fibrous connexions. He then passed a thread through the sclerotic on the outer side of the globe, by means of which he produced mechanically, without cutting the external rectus, complete rotation of the eye inwards. The thread was fastened so as to keep the globe in this position for a day or two, by which time the internal rectus had formed a fresh union with the sclerotic near the margin of the cornea.

Professor A. von Graefe has modified Guérin's operation, so as to render it more simple, certain, and safe; he avoids the minute dissection of the muscle, merely separating it with the surrounding conjunctiva, fascia, and cellular tissue, to such a degree from the globe, that the whole mass can be brought without force as far as the cornea. Another alteration is, that Von Graefe divides the external rectus, and passes the thread, by means of which the eye is kept rotated inwards, through the remnant of the tendon, and not through the sclerotic itself.

Many cases of paralytic squint require a similar treatment to that just described for secondary strabismus. So long as the affection is recent, the question of an operation cannot be entertained, for in a great number of such cases treatment or time effects restoration. It is only in old cases, where all hope of such an occurrence must be abandoned, that we have to consider the propriety of further proceedings.

Should the paralysis entirely disappear after the opposite muscle has contracted, a simple concomitant squint is the result, a condition that demands from us no further remark. Sometimes, however, the paralysis only partially disappears, whilst the opposite muscle contracts, thus producing a mixed condition. The treatment must then be modified according to the degree of contraction, and according to the degree of paralysis. In respect to the latter, we may remark that if the concomitant strabismus is accompanied by an insufficiency of the paralyzed muscle to less than two and a half millimetres, tenotomy of the contracted muscle is alone demanded, a little more than the usual attention being paid to the after-treatment. Thus a patient presents, as an effect of paralysis of the external rectus of the left eye, a concomitant squint and a muscular insufficiency of two millimetres in the direction outwards. Tenotomy of the internal rectus must be performed in the manner already explained, just as if only the concomitant squint had to be treated. After the operation, the eye must be kept directed outwards by means of proper goggles. When the insufficiency is to a greater extent, so as to produce a deviation of three or four millimetres, the eye must be forcibly rotated towards the uncut muscle for twenty-four to forty-eight hours after the operation. In cases of divergent squint, this may be effected by means of a thread passed through the tendon of the divided muscle, between the globe and the point of division.

If the insufficiency is still greater, success will not be gained by simply weakening the antagonist; the paralyzed muscle must itself be strengthened. Its insertion must accordingly be brought forward in a manner closely resembling that already briefly described for secondary strabismus. The surgeon will often have some difficulty in deciding whether further delay is advisable or not; he will find the constant occurrence of troublesome diplopia one of the best indications of the necessity of operative treatment.

Dr. Meyer justly remarks that similar treatment may be demanded by certain cases of concomitant strabismus, when accompanied by considerable loss of mobility in the opposite direction.

We may remark, before concluding, that Professor von Graefe has abandoned entirely, or almost entirely, partial tenotomy, having found the conjunctival suture a better means of modifying the effect. One curious error also deserves notice; at p. 15, the author refers to Stromeyer's well-known work, the 'Beiträge zur Operativen Orthopädik,' in the following extraordinary manner: "En 1838, *M. Strohmeyer*, dans un *journal* de Hannover, les Beiträge zur operativen *Chirurgie*," &c.

Our opinion of Dr. Meyer's essay has been already to some extent mentioned; we may here remark, that we consider it to give on the whole a full and satisfactory account of the present method of treating strabismus. As such we recommend it to our readers, all the more because it contains a useful bibliography, is written in a clear and pleasing style, and is sufficiently illustrated by diagrams and drawings.

ART. V.—*Wine, the Vine, and the Cellar.* By THOMAS GEORGE SHAW.—*London*, 1863. pp. 505.

IN the hostelrie of the Three Moors, at Augsburg, once the residence of the more than merchant princes of the sixteenth century, the magnificent Fuggers, is a cellar which contains not only choice wines, but a choice of wines both in quality and rarity, such as would lead any one to believe that the owner had ransacked the world to furnish it, or that he had accompanied Bacchus on his vinous voyage round the globe, culling a sample wherever he found it worthy of remark.

This cellar is, however, a mere *échantillon* of what the world does produce; and in the work now before us, 'Wine, the Vine, and the Cellar,' we have a list of 2447 different wines—different in name, at least, possibly to the educated palate, in taste also. Of these, no fewer than 1540 are the product of "the vine-covered hills and gay valleys of France" alone.

This work of Mr. Shaw is a curious one, and, we think, a fairly reliable one; but it does not quite justify the motto it bears—

"Nullius addictus jurare in verba magistri."

We have closely investigated the process on the Douro, in Xeres, Cadiz, Port St Mary, and the whole south coast of Spain, from Saragossa to Malaga; and by this test we judge Mr. Shaw's account to be substantially correct.

Though there is much curious and some amusing information in the work, and much that is useful, yet it is rather by the trade than by the private consumer that it will be read and referred to.

Let any one, however, peruse the following statement, as to the manufacture of *port*, the "vinum rubrum" of our hospitals, and form his own opinion of the wholesome nature of this mixture:

"To produce black, strong, and rich wine, the following are the expedients resorted to: the grapes being flung into the open vat indiscriminately with the stalks, sound and unsound, are trodden by men till they are completely smashed, and then left to ferment. When the wine is about half fermented it is transferred from the vat to tuns; and brandy (several degrees above proof) is thrown in in proportion of twelve to twenty-five gallons to the pipe of must (about 25 per cent.), by which the fermentation is generally checked. About two months afterwards this mixture is coloured thus: a quantity of dried elderberries is put into warm bags, these are placed in vats, and a part of the wine to be coloured being thrown over them, they are trodden by men till the whole of the colouring-matter is expressed, when the husks are thrown away. The dye thus formed is applied according to the fancy of the owner, from twenty-eight to fifty-six pounds of the dried elderberries being used to one pipe of wine. Another addition of brandy, from four to six gallons per pipe, is now made to the mixture, which is then allowed to rest for two months. At the end of this time it is, if sold, sent to Villa Nova, when it is racked two or three times, and receives probably two gallons more of brandy per pipe, and then it is considered to be fit to be shipped to England, it being about nine months old. At the time of shipment one gallon more of brandy is usually added to each pipe. The wine tuns having received at least twenty gallons of brandy per pipe, is considered by the merchants as sufficiently strong."

This statement must, however, be taken with a large deduction, for clever as the writer (Baron ? Forrester) was, there are many who think he was too clever; and in this description he has calculated his quantities wrongly. This description is not a just one as applied to first-class port wine. A visit to the farms in the Alto Douro will prove this. In the best wine districts the elder-bush is now rarely seen, while in the low wine country it abounds; and elderberries will not keep long in a dry state.

That brandy, elderberry, and *cheropiga* (a strong syrup made from must, the fermentation being stopped by spirit), form the bases of cheap, low ports, is undoubtedly the case; and our rich, fruity ports, at a low figure, are thus compounded.

The time, however, is at hand when we shall get from the Douro an excellent, invigorating, wholesome wine, at a cheap rate; and it behoves our great shippers, our Cockburns and Crofts, our Gassiotts and Grahams, to look to it; not that real fine port wine can ever be superseded—when it is real first-class vintage wine it is the noblest of wines—nectar. But the "liberation of the Douro" has been decided on; it is only a matter of time, and, ere long, the low class and made-up stuff will be displaced by a genuine article less costly, far more palatable, and infinitely more wholesome. There is no reason why these old, respectable firms should not send us their wine of the best, as they now do port, and thus put their stamp—we beg their pardon, *brand*—upon it.

What is the meaning of a vintage wine? a much-used, but little understood term. It is this: the wine as made up in the country, and sent down to Vitta Nova, and no addition except a per-centage of brandy added before shipment, may be held to be true vintage wine; as such, when bottled, it is to be depended upon to come out, and keep as it comes out, plus the improvement by age and maturing in bottle, for a reasonable time, varying according to the goodness of the year.

But an immense proportion of so-called vintage wines is made by mixing wine of various ages, flavour, colours, and strengths together. An order comes out from England for wine of a vintage which has pleased the public palate; if these wines are valuable, as they are sure to be when the public taste is taken, then the combination ensues, and woe to the luckless squire who, laying down a pipe of 184—, expects to find, at the end of seven years, what a true vintage wine should be.

These various ingredients change places, the more incisive flavours predominate, and the fragrance gives way to other and distinct odours, which obtain different names, but only one judgment, in condemnation. We have had wine made before our eyes to resemble, perfectly, vintages long since exhausted in stock; but the fabrication would have been detected in a very short time after bottling. It is needless to add, that no such houses as we have named would pass off a wine thus prepared as a vintage wine.

The same process, doubtless, goes on in other wine-making districts. The sherries are blended, fortified, and sweetened, to meet taste and market.

While staying at that paradise of gardens, Cintra, we visited Colares, a spot near the shore of the Atlantic, where the *Oïdium* has not reached, and for this reason, not for the quality of its wine, has become noted. We wished to taste the wines of 1862, but the farmer told us he had sold all his stock to *the Bordeaux Wine* Company, at Lisbon, to be converted into claret!

These conversions are not peculiar to Portugal; and no doubt large quantities of *genuine wines* are sold which have no nearer approach to the vineyard than Greenwich Reach has to Spain. In the opulent and hospitable city of Hamburgh, however, we can testify to the manufacture of Elbe ports, sherries, and madeiras. A few months since we spent a morning with a wealthy farmer and miller on the Hanoverian bank of the Elbe. After inspecting his sleek cows, his huge pigs, and his well-tilled meadows, he invited us in to drink—to liquor up, as the Americans would say—and placing before us port, sherry, madeira, brandy, and beer, said, "The first four are all genuine Hamburgh, 'therefore good;' the beer I make at home, pardon any defects therein." Our choice was not doubtful.

All these wines are compounded of sugar, corn, or potato brandy, and a wine-essence, for which the distillers are indebted to the chemists; and from these are compounded every wine, from "humble port to imperial tokay."

On the whole, the perusal of this work will not tend to increase the consumption of wine. No thinking man can fail to see what trash he may, nay, must often swallow. It will teach those who can afford it to be careful in their choice, and it will tend to exalt the confidence placed in old, well-known firms, who have everything to lose, and nothing to gain, by vending inferior wines.

The question of consumption of wines is a very debatable one; it is very doubtful whether a cheap, light wine, with low alcoholic powers, will ever become a favourite beverage with the English multitude. It will replace beer on many middle-class tables; it has long had its place at all first-class boards; but the artisan and labourer will never change a pint of ale or porter for a gill of Beaujolais. We shall be met, no doubt, with impost-tables to disprove this, but how much of that goes, we should like to know, into a compound like Colares claret, or Elbe port?

That many new varieties of wine—new that is to our country—will be introduced as freer communication takes place, is certain. Spain has many good wines to send us, when the railways, which are stealing their way over that slow-moving country, are finished. The wines of Catalonia, like its people, are high-coloured, rough, and strong; and if more care were taken in making it, if the grapes were better selected, and casks used instead of the "borrachio" for its transport, a good flavoured, potent wine might be had at a low, *very* low price.

We own to a disappointment on our first introduction to Val de Peñas; from Don Quichotte to Ford we were romantic in our ideas as to its transcendent merits. We remembered the stanza which we now translate in lines as rough as the liquor:

> "Our hero look'd on as calm and serene as
> A man with a bottle of old Vale de Peñas;
> When his father and mother are both lying dead,
> And his child has been kick'd by a mule on the head."

At first we liked not this soothing nepenthe, but a longer acquaintance proved its value as a wholesome table-wine, much diluted with water, *more Hispanico;* and we felt the force of the stanza to lie in the word *old.*

When the combination of the men of beef and barley (those who when

> "Pheasants and partridges, turnips and ploughshares,
> Once clothed the back benches in buckskin array")

with the financial reformers compels Mr. Gladstone to review the whole question of wine, beer, and spirits, in relation to the malt-tax, we shall expect to see Mr. Shaw's book much quoted; then he will prove triumphantly the superiority of bad wine over worse beer at "fourpence the gallon."

Though there are in the book many things which *the trade* will not entirely subscribe to, it is a book of much public utility.

ART. VI.—*Norsk Magazin for Lægevidenskaben.* Udgivet af det Mediciniske Selskab i Christiania. Anden Række. Redigeret af W. BOECK, LUND, A. W. MÜNSTER, VOSS, FAYE.—*Christiania,* 1862–3.

Norwegian Magazine of Medical Science. Published by the Medical Society of Christiania. Second Series. Edited by W. BOECK, LUND, A. W. MÜNSTER, VOSS, FAYE.—*Christiania,* 1862–3.

HAVING very recently brought under review the existing condition of medical science throughout the Iberian peninsula in former numbers of this Journal, and that even at some length, we would now, in continuation of previous observations likewise made, briefly direct attention to another but more northern region of Europe, which equally deserves notice from British practitioners — namely, Norway — and whereof the monthly medical periodical whose title heads the present article constitutes a good exponent. Of course, we do not propose giving any detailed account of the numerous professional questions which have occupied the pens of Scandinavian medical writers since the publication above specified was last alluded to in our pages, seeing space would not permit making extended references to all the subjects therein discussed. For the reason here assigned, we therefore at once proceed to fulfil the limited task proposed without further preface, that is, merely to trace an outline of one or two interesting local subjects the Magazine contains, and which seem worthy of communication to our readers.

Believing that some general summary of the principal diseases which affected residents of Christiania during the past year might prove instructive, we would therefore remark that, according to tables published, the maladies most prevalent in the four different districts of that city in the winter quarter comprising the cold months of November, December, and January, 1862–3, and reported by the practitioners attending such cases, were as follows: Catarrh gave 795 examples, whereby 11 patients died. Scarlatina attacked 200 persons, followed by 23 deaths. Diarrhœa, 211 cases, of whom only 1 proved mortal. Fever occurred in 180 individuals, which, however, terminated fatally in not more than 7 cases, all being of the typhoïd type. Pneumonia exhibited 100 examples, whereof 10 ended in death; while 87 cases were classed as diphtheritis, of whom only 2 died; and, lastly, 71 patients were reported to have laboured under either syphilis or gonorrhœa throughout the period just specified. By way of contrast, or as partly indicating the influence which season and other causes produce on the health of residents in this northern metropolis, the subjoined statement respecting analogous diseases, which were similarly reported during the warm summer months of May, June, and July, may be here quoted—viz., catarrh affected 271 persons, of whom 2 died. Diarrhœa gave 260 cases, but no death. Fever attacked 123 individuals, being fatal in only 1 instance, and that designated as typhus. Pneumonia affected 85 patients, 6 of whom died. Diphtheria showed 42 cases, whereof 1 proved fatal; whereas scarlatina, which raged so prevalently during the previous inclement season, supplied not more than 13 examples, of whom 2 ended in death; and syphilis, including gonorrhœa, presented 42 instances, against 71 cases during the former quarter. From these data it clearly appears that pneumonia and diphtheria proved nearly as prevalent at Christiania during warm weather in summer as throughout the cold winter months; while bowel complaints were much about the same in frequency at both periods, venereal diseases being, however, most rife in the trimestre just named.

Among various articles in the Norwegian periodical which deserve notice, the following may be mentioned: "Notes on the Therapeutic Influence of Electricity, by A. Arndtsen." In this paper the author relates the result of his own inquiries made during a tour in Germany and elsewhere; but the paragraphs taken from foreign authors, and cases showing the influence of electricity upon local affections, however instructive to native practitioners, seem not of sufficient novelty to deserve quotation on the present occasion. An elaborate "Essay on Tumours," by H. Boeck, occupies many pages in several numbers of the journal under review. Like the previously specified paper, having also a historical character, it cannot but prove instructive to the author's countrymen; and further, seeing that many important observations of numerous foreign writers, among others our English Coopers, Addisons, Birketts, and Pagets, are often referred to in the discussion, such a feature proves the author to be well acquainted with the subject he investigates. M. Skjelderup next communicates an extended treatise on the "Pathology of Hysterical Affections," wherein these Protean maladies are investigated at great length, not only with reference to the morbid alterations of structure usually observed, but likewise their symptoms, complications, etiology, and season of the year when most prevalent.

Somewhat analogous to the animated discussions which lately occupied professional attention throughout Great Britain, the subject of altering medicinal weights and measures in Norway has likewise been brought under professional notice, especially by Prof. C. Boeck, the Expedition's-chief T. Kïerulf, and Apothecary A. M. Lund, who publish an extended paper on that vexed question in the Magazine.

An extended "Report on Syphilization," which actually occupies upwards of 200 pages of the journal now reviewed, is also worthy of perusal. Being drawn up by a committee appointed to investigate that subject, which comprised the City naturalist Steffens, Dr. Egeberg, and Prof. Voss, these names are a sufficient guarantee respecting the value of the elaborate document they publish.

A Report from the surgical division of the National Hospital at Christiania is next given, which contains an account of the operations performed in that institution during 1861, and also of the chief accidents which there came under treatment. Among the 184 operations that statement embraces, 10 were amputations; 3 lithotrity; 10 exarticulation of fingers, with 1 at the hip-joint; 22 cataracts; 12 iridectomy; 9 hydrocele; 4 hernia, 3 being reduced and 1 operated upon; 3 tracheotomy; 2 dislocations, besides various other instances of a minor description not necessary to specify. In addition to the above cases, wherein some surgical operation had been performed, 62 patients were treated for fracture, the chief examples of that kind being 13 who had the thigh broken, 12 the leg bones, 9 the humerus, and 12 in which only 1 of the arm or leg bones was fractured. The results following the treatment pursued in the several cases thus classified not being recorded, it becomes therefore impossible to judge whether Norwegian surgery proved more successful than that generally obtained in other countries; and although the account now given is defective in so important a particular, still, as indicating one feature characterizing the institution just named, the facts above-mentioned appear sufficiently interesting to be quoted on the present occasion.

The periodical which has thus briefly been brought under notice, besides containing original matter, often of much interest and contributed by eminent authors belonging to the profession in Norway, likewise gives frequent reports of important papers read at meetings of the Christiania Medical Society. The discussions which there ensue among members, however interesting to hearers, and although many of the communications must doubtless prove instructive to those who read the publication wherein they are reported, our limits preclude further allusion to the various subjects discussed. Indeed, our present brief reference to the above-named association and its proceedings is chiefly made to inform British practitioners that, in this northern kingdom of Europe, meetings for discussing medical questions seem quite as much an order of the day as throughout other regions farther south, the natives whereof sometimes consider themselves much more advanced in knowledge and civilization than residents of countries who are less favoured by nature, or even possess, in many respects, but a limited intercourse with peoples enjoying far greater advantages.

Reviews of works lately published, extracts from other journals, as well native as foreign, with local news, and cases occasionally also, further occupy various pages in different numbers of the Norwegian Magazine. Intelligence of that description, however interesting it may be to the customary readers of this really well-conducted publication, being often mere quotations from similar scientific vehicles printed in other countries, need not be here reproduced; consequently, we now take leave of our esteemed northern contemporary, with expressing a *confrère's* best wishes for its future continuance, augmenting circulation, and prosperity.

ART. VII.—*An Essay, Historical and Critical, on the Mechanism of Parturition.* By WILLIAM LEISHMAN, M.D., Physician to the University Lying-in Hospital, Glasgow.—*London*, 1864. pp. 129.

THE author states in his preface that whoever takes the pains to study the mechanism of parturition in nature will soon discover that too much is taken for granted, and that there is more yet to learn. In this we entirely concur. The unquestioning confidence with which the description of a great master in obstetrics are copied from one text-book to another is one of the most remarkable illustrations that can be adduced of the pernicious influence of authority in paralyzing the spirit of free inquiry, and of the perpetuation of the ignorant bliss which is the fruit of servility and indolence. Some men are apt to find the care of ordinary cases of labour irksome and uninteresting. If they will only make up their minds to continue diligent and independent observers of nature, they will surely not lack material for instruction and profitable reflection, even in the most ordinary obstetric practice. And thus, constantly studying first principles, and taking, as it were, nature's standard, they will be better fitted to estimate correctly the deviations from natural labour, and to determine the mode of treatment to be adopted in difficult cases.

This is the principle which, animating Dr. Leishman, has led to the production of the excellent work before us, the foundation of a solid reputation as an observer and thinker, ensuring for the author a respectful attention for any future contributions which he may submit to the profession.

The first chapter is introductory and historical. We pass over the passages devoted to the early history of the obstetric art, pausing only to applaud the spirit in which the author condemns the sordid conduct of the Chamberlains in keeping secret their presumed discovery of the forceps. It has been the custom of English writers to gloss over this inexpiable meanness of the Chamberlains; to grub prostrate in their hiding-holes; to track their tortuous steps, in order to assign to each particular member of that most mercenary family his particular share of the hidden treasure. These efforts are vain, and ought to be so. The Chamberlains preferred money to honour. Why should posterity trouble itself to bestow upon their memories that reward of noble minds which, living, they contemned?

Dr. Leishman traces the steps by which the modern more accurate views of the mechanism of labour were attained—first through the observations of Ould and Smellie in this country, then through those of Saxtorph and Solayrès de Renhac abroad, to the time of Nägele. He dwells especially upon the writings of Saxtorph and Solayrès, believing that these have been too much neglected, and that they are entitled to more merit as preparing the way to the views proposed by Nägele than they have hitherto received.

The author describes the essay of Solayrès as one of the most able and original works in the whole range of obstetric literature. It is certain that Nägele was much indebted to it as a guide in his own researches. Nor does that eminent man omit to acknowledge his obligation. The doctrines of Nägele are so engrafted on the system of obstetric teaching in this country, that it is not necessary to enter into a formal exposition of them, although they must serve as the basis of all criticism on the mechanism of labour. One of his leading propositions, which has been strenuously contested of late, is that which declares that the head does not enter the pelvic brim in a direct but in a perfectly oblique position, so that "the sagittal suture is nearer to the promontory of the sacrum than to the pubes." This implies that the child's head is in a state of lateral flexure, bringing the ear into approximation with the shoulder. This is especially denied by Dr. Matthews Duncan. This observer affirms, we think correctly, that the axis of the child's body, of the uterus, and of the brim of the pelvis, are represented by the same line; that the head at the *moment* of entering the brim is in exact conformity with this common axis, and that it is only when the head has made some progress in the cavity that the sagittal suture is found nearer to the promontory than to the pubes. There is no lateral flexure of the head. This view receives an elaborate confirmation from Dr. Leishman, whose demonstration deserves special attention. He assumes that the fundamental error from which, more than any other, Nägele's mistake arose, was an ignorance at the time this author wrote of the great obliquity of the brim in respect to the horizon. There must, he thinks, have been remaining in Nägele's mind some remnant of the old idea of the *horizontal* brim. Dr. Leishman argues that if we do not lose sight of the fact that the brim is inclined at an angle of 60°, and that the vertex or presenting part passes downwards and backwards so obliquely as to meet the horizon at an angle of 30°. Even admitting that the right parietal bone, in the vicinity of its tuber, is the lowest part in the pelvis, this must be accepted as evidence that the head is advancing directly in the axis of the brim; but very obliquely with regard to the cavity.

Dr. Leishman further disputes Nägele's statement that the ear is commonly felt with ease at the beginning of labour, and the argument built upon it that this is a proof of the great obliquity of the head. When it can be so reached, Dr. Leishman contends that this is simply proof that the head approaches the transverse diameter more than usual. The upper part of the pubic symphysis is that which is nearest to the outlet, and owing to the inclination of the brim, when the ear moves to the side it moves at the same time *upwards* along the ileo-pectineal line, and consequently further from the finger. This is very well stated, and offers, we believe, the true explanation of the occasional facility with which the ear is reached at the commencement of labour, and of the difficulty of reaching it at a later stage.

There is another controverted point—one, therefore, fit for renewed observation. Nägele affirmed that the forehead is directed forwards at the commencement of labour in a large number of cases, the occiput coming forwards at a later stage. He also taught that the forehead thus presented in the proportion of two to five cases of primary occipito-anterior presentations. Dr. Halahan contends that the head is always so placed at the beginning of labour that the face is directed forwards; that the fourth position changes at the beginning of labour into the first, and that the third does not change into the second until the head is distending the perinæum. This is one extreme, certainly occasionally true, but too absolute by far according to our observation. We will mention our objection to it. It has been our opportunity to examine the bodies of several women who have died either before labour or in the early stage. The head was always found in an oblique position—that is, the occiput turned towards one or other foramen ovale. The same fact may be commonly verified in the living subject. This, then, is the normal position of the child before labour. Must the child undergo a constant rotation upon its own axis before it can enter the pelvis? Must the face always perform a quarter revolution forwards, and then turn back again? For this is what Dr. Halahan's statement involves. We cannot assent to it. As representing another extreme, we have Dr. R. U. West, of Alford, whose work we have on a former occasion noticed. This most excellent observer says that Nägele is quite wrong, and he adheres to the old opinion that the second presentation is, next to the first, the most common. Thus he found in 481 cases that the occiput was directed to the left foramen ovale at the beginning of labour in 63 per cent.; to the right foramen ovale in 31 per cent.; to the right sacro-iliac synchondrosis in ·03 per cent.; and to the left sacro-iliac synchondrosis in ·018 per cent. This is a widely-different view from Nägele's. We are disposed to think it substantially correct, admitting that we have on many occasions observed the face to turn backwards from a transverse or even anterior aspect.

One piece of evidence, much insisted upon by Nägele as proving the oblique entry of the head into the pelvis, is the situation of the caput succedaneum. This tumour, he says, is situated upon the right parietal bone, close to its upper edge, and equidistant from both angles. With this testimony, Dr. Leishman, acknowledging his obligation to Dr. Duncan, deals in the following manner: This situation of the swelling may indicate one of three things. The os may either be inclined forwards, or it may be subjected to greater pressure at certain points of its circumference, or, again, the head may be placed obliquely. Dr. Paterson maintains that the os is inclined forwards; but this is not capable of demonstration. Dr. Duncan denies that the thickest or most prominent part of the swelling corresponds to the centre of the area upon which it is formed, but says it is to be found in the direction in which the least resistance is offered. The caput succedaneum is often formed after the head has passed the brim, and is lodged in the upper half of the cavity. Now, it is only those swellings which are formed at the brim that can assist in instructing us as to what passes at the brim as regards the position of the head. It is evident, argues Dr. Duncan, that the direction of the caput succedaneum of the first stage will be that of least resistance—

that is, the direction of the axis of the undilated vagina; i.e., the caput will be thickest where the head is least supported, and may, in other parts within the centre of the os uteri, be so inconsiderable as not to attract notice. The centre of the caput succedaneum, or the centre of the os uteri, will not correspond with the thickest portion of the swelling, but in this case be behind it, or near the left parietal bone. The oblique direction downwards and forwards of the vagina will lead the caput in that direction, and the support given by the posterior wall of the vagina to the posterior half of the space enclosed in the circle of the os will cause thickness of the swelling over the right, and comparative thinness over the left parietal bone, and displacement of the thickest portion of it formed in the pelvis—that is, in the direction of the right parietal, and away from the left parietal bone.

This explanation is new and ingenious. It will require close observation at the bedside to confirm its accuracy.

Dr. Leishman finally rejects the theory of the lateral or transverse obliquity of the fœtal head at the brim on the ground that this obliquity is quite unnecessary, there being ample space for the head to enter in its full transverse diameter.

We have stated these views thus fully because they strike boldly, if not fatally, against one of Nägele's fundamental propositions, and compel a new and unbiassed appeal to clinical observation.

Howsoever difficult it may be to determine with precision the direction of the head at the brim, there ought to be less room for the controversy as to the state of things in the cavity, and still less at the outlet of the pelvis. The author assents to the correctness of Nägele's description of the positions assumed by the head in these situations. He admits the lateral flexion of the head *in the cavity*. He vindicates the truthfulness of Nägele's description, which affirms that the head does not emerge with its occipito-frontal diameter in a line with the conjugate diameter of the pelvis, but maintains, to a certain extent, its relation to the oblique diameter of the pelvis with which it presented itself at the brim. That this, at least, is true, we are amply satisfied. The exit with coincident long diameter of the head and conjugate diameter of the pelvis is a rare exception. Dr. Leishman describes a very neat and satisfactory mode of observing the position of the head at the exit. He draws a cord along the vulva, fixed at one end to the coccyx, to the other at the symphysis. The cord so stretched must so mark the head emerging between the labia as to indicate its position with precision. This line will be found to cross the sagittal and coronal sutures, the former at a point much nearer the anterior than the posterior fontanelle.

The author enters rather fully into the discussion of the vexed question of whether it be proper or no to "support the perinæum." His conclusion is that the practice, as usually adopted, is not only useless but injurious. The whole matter, as stated by Dr. Leishman, deserves attentive perusal. Concurring with him in deprecating that early, continuous, and firm pressure upon the perinæum, inculcated by some practitioners, as calculated to irritate and inflame the structures, experience compels us to dissent from the dictum of those who deny that a judicious pressure at the proper time in such a manner as to prolong, so to speak, the coccyx and perinæum, can aid the expulsion of the head by favouring the revolution of the head around the pubic symphysis. We are satisfied that by this pressure alone we have terminated several lingering labours, when the forceps was the next alternative.

The author confirms the accuracy of Nägele's observations relative to the frequency of the primary occurrence of the third position; the ordinary conversion of it into the second position; and the occasional descent and transit of the head in the third position through the pelvis. We have ourselves found on several occasions, chiefly in primiparæ, that the persistence of this third position—that is, the forehead remaining directed to the left foramen ovale instead of turning backwards—has been the cause of arrest of labour, and an indication for delivery by the forceps. Upon this subject we venture to disagree with Nägele, and those who follow him, in affirming that when the head is born in this position it is because the head was small, or the pelvis large. Most certainly we have observed this mode of delivery in cases where the head was of full size and in fair proportion to the pelvis.

It will be seen, from this rapid survey of Dr. Leishman's interesting work, that great as is the authority of Nägele, we have not yet arrived at that stage where we can rest and be thankful that there is nothing more to do or to learn. We must still observe as well as read. We must still appeal from Nägele to Nägele's instructor, Nature herself. Whether or no renewed observations will in all points confirm Nägele's doctrines is of secondary importance. The constant resort to clinical study, the comparing the observations of others with our own, cannot fail to train the mind to more accurate knowledge and to improve obstetric practice. We take leave of Dr. Leishman for the present, with thanks for this contribution, and the confident expectation of future instruction from his pen.

ART. VIII.—*Annals of Military and Naval Surgery, and Tropical Medicine and Hygiène; being an Annual Retrospect, embracing the Experience of the Medical Officers of Her Majesty's Armies and Fleets in all parts of the World.* Vol. I., for the Year 1863.—*London*, 1864. pp. 376.

"THE object of this work is to comprise in one portable volume a retrospective history of military and naval medicine and surgery during each year, carefully noting every fact and opinion of importance, and thus fostering a useful *esprit de corps*, and awaking and stimulating inquiry."

This extract from the Preface explains what is the aim and scope of the 'Annals.' The idea is happily conceived, and, as far as we can judge, well carried out. The naval and military services have now become in some respects a special branch of the medical profession, with a literature of their own. This literature is very extensive, and scattered in a variety of places. It appears in the shape of Parliamentary blue-books, reports of medical officers, contributions to reviews, papers in the weekly journals, &c. &c., besides the more formal and elaborate works on questions of "military medicine" which are constantly issuing from the press. But how are the naval and military surgeons when stationed in distant parts of the world, perhaps at the very outskirts of civilization, far away from libraries and reading-rooms, with no facilities for communication, and with every reason to avoid accumulating expensive and cumbrous volumes—how are men in such circumstances as these to make themselves acquainted with what is going on in their own special branch of the profession? That is the problem which the compiler of the 'Annals' has set himself to solve; that is the difficulty out of which he wishes to help his brethren. The means which he has adopted are simple and efficient. In dealing with the general literature of the profession, we have long found it necessary to have our Retrospects and our Annuals: now the same principle has been applied to a special branch, where such condensation was particularly wanted. The volume before us—so small and compact that it will add very little to the surgeon's "kit," and so closely printed that it contains a vast amount of information—will supply the medical man with the most recent facts, theories, plans, and suggestions which are current among his brethren. That naval and military surgeons should be furnished with such knowledge is the more important when we consider what advantages they have for making sound observations and drawing useful conclusions. They are in charge of bodies of men who are entirely under orders, and whose physical state can be watched from year to year. Moreover, these bodies of men are placed under conditions of life exactly similar; and yet these conditions are liable to undergo complete and sudden changes, as when a regiment is moved from the temperate to the torrid zone, or from a hill-station to one on the level of the sea. In this way a sort of natural experiment is made, which is the less likely to mislead because it is conducted on a large scale. These are some of the advantages which naval and military surgeons possess over those in civil practice, and it is of the utmost importance that they should be used for the promotion of medical science. But before we can take a step in advance we must feel the ground firmly under our feet; and before we can add to the store of knowledge we must know what has been already accumulated. To supply such information is the object of the 'Annals of Military and Naval Surgery.' The compiler has brought together a great variety of subjects, collected from a number of different sources. We have statistics of the rate of sickness and mortality in each "command;" observations on hygiène; reports on gunshot and sabre wounds; practical papers on vaccination, on the venereal diseases, on fevers of various kinds, on cholera, on dysentery, &c. &c., with remarks on treatment, and on the value of some new remedies. These are some, and only some, of the subjects which are treated at greater or less length. A distinct section has been devoted to each station of the Army and Navy, so that its health-history may be studied with the greater facility. As far as possible papers have been given *in extenso*, or else the most important passages have been extracted; and in this way authors have been allowed to speak for themselves. To condense a volume which is itself a condensation, so as to give any adequate idea of its contents, would be impossible; we have, however, made a few extracts which will serve as specimens of the lighter parts of the book, and which can hardly fail to interest our readers:—

"To show the effects of being hit by a spent ball, or one that has lost its greatest impetus, I may mention a case that came under my notice, where a colonial volunteer was standing talking in a group of his comrades, and was struck by a ball in the abdomen, over the region of the bladder. The ball fell on the ground at his feet, without either injuring his clothes or even marking the skin. He did not feel much pain at the time, and walked to the hospital, a distance of two miles, with the ball in his pocket, without feeling much pain, but he died shortly afterwards from peritonitis and extensive inflammation of the bladder. The entire surface of the abdomen presented the appearance of a severe bruise in a few hours after being struck."[1]

A traveller in Afghanistan gives us a curious insight into native surgery:—

"The Afghans, from their rough and hardy mode of life, acquire by experience a number of very practical, though, to be sure, uncouth methods of righting themselves, their horses, and cattle, that may suffer from accidents. Their operations for the reduction of dislocations in the human subject are most original, and if report speaks at all truly, equally successful.

"For a dislocation of the thigh, the unfortunate patient is sweated for three days in a dark room, the atmosphere of which is heated by fires kept burning night and day; and the effects produced by this high temperature are increased by drenching the patient with copious draughts of warm rice-water or thin gruel. During the interval that this treatment is enforced on the patient, a fat bullock or buffalo is tied up and fed *ad libitum* with chopped straw flavoured with salt, but is rigidly denied a drop of water. On the third day the patient is made to ride the bullock astride, a felt alone intervening between himself and the animal's hide; his feet are next drawn down and fastened tightly under the animal's belly by cords passing round the ankles. All these preliminaries arranged, the animal is then led out to water, and drinks so greedily and inordinately that its belly swells to nearly double its former size; the traction produced by this on the dislocated limb is sufficient to bring the wandering bone back to its socket."[2]

In a paper on "Drink-craving," we find the following extraordinary case related :

"Isabella Hay is the child of a healthy mother, and a father who has suffered repeatedly from hæmoptysis. She is now two years and a half old. When about ten months old she began to suffer from indigestion and diarrhœa, which apparently arose from debility consequent on teething, rather than from errors in diet. The disease proved unmanageable from the beginning. It was possible to check it through the administration of medicine, but not to eradicate it

[1] Art. V., On Gunshot Wounds.

[2] Art. CXXI., Journal of a Political Mission to Afghanistan in 1857.

so far as to admit of the reappearance of appetite for usual food and of digestion. Food of any sort was neither tolerated by the bowels nor by the stomach. Its introduction almost immediately reinduced vomiting and purging. The mother predicted speedy death, and everything foreboded that the prediction would be realized. In the course of treatment port wine was prescribed, and from the very first borne by the gastro-intestinal canal, and relished by the patient. The infant took it greedily, and very soon began to cry for it, as in health she might have cried for the breast. I ordered the remedy to be given freely, and so strong was the patient's craving for the stuff that she drank of it daily from twenty to twenty-four ounces. The rumour of this intemperance began to spread, and the child soon became the talk and marvel of the neighbourhood. Once, to satisfy her importunity for stimulants, her father substituted gin for port wine, and the relish for this immediately displaced the relish for the other. After this gin became her favourite drink. At this time her pertinacious appetite for alcohol, the ravenous manner in which she consumed it, the debility and peevishness of temper which characterized her before her cups, and the strength and good humour which characterized her after, constituted this infant a real drunkard."[1]

It will be observed that this is the first volume of the 'Annals' that has been published. They are just entering on existence. Whether their life is to be a long or a short one, will depend upon the reception they meet with from the profession. We trust that reception will be favourable, and that year by year we may have the pleasure of noticing the issue of a new volume.

ART. IX.—*Lessons in Elementary Botany, &c.* By DANIEL OLIVER, F.R.S., F.L.S., &c. With numerous Illustrations. pp. 319.

THIS little book is in part based upon materials left by the late Professor Henslow, whose success as a teacher of botany was in many way very remarkable.

Professor Henslow's manuscript was left in an imperfect and fragmentary state, hence it became necessary to revise and recast it, and this has been done by Professor Oliver, who has also added, by way of introduction, "a few chapters embracing the elements of structural and physiological botany, treated in as simple a way as appeared consistent with practical usefulness." The book is in plan and treatment very similar to an excellent one written some years since by Maout, and entitled, 'Leçons Élémentaires de Botanique,' but is less wide in its range. A few common wild flowers are described in as simple language as possible, and contrasted one with the other, so as to familiarize the pupil with the different organs of plants, and the different forms under which they occur. The minute structure and physiological uses of the organs are incidentally treated of, and when the elements of the subject are thus mastered, the pupil is in a position to examine and describe any flowers which may be within his reach, and thus be led to acquire an insight into the important subject of classification.

In order to aid the student in drawing up correct descriptions, a

[1] Art. CXXII., On Drink-craving.

number of "schedules" are given, the purpose of which is to compel attention to those points which are of the first importance (because most constant) in the structure of flowers. The value of this plan is hardly to be over-estimated, as it keeps essential points constantly in the mind of the student, which is the more necessary, as from the multiplicity of detail, the pupil is likely to get embarrassed without some such aid, and to attach as much importance to minor points as to others of greater consequence. Schedules of this kind are used in illustration of many of the most important of the natural families of plants, in connexion with which is also given a brief account of the structural peculiarities of each order, and a notice of the economical uses to which members of the family are applied.

In a future edition it is hoped that Professor Oliver may remedy a defect running through the majority of the schedules; thus, under the head of cohesion, and referring to the stamens, the number of those organs is given, and, unless in a few special cases, no reference is made to the isolation or cohesion of the stamens; again, the schedules would assuredly be more complete by the addition of a column or columns for the insertion of the structural peculiarities of the fruit. In a book of this size, professedly elementary, and intended simply as an introduction to more complete treatises, we ought not to look for many details as to the uses of plants; yet we should have been better pleased to have seen this subject treated a little more fully—for instance, hemlock, *Conium maculatum*, is said to be "distinguished by its spotted stem and mouse-like smell;" now the former characteristic is common to a number of British *Umbelliferæ*, and the latter is not always recognised by pupils. In noticing these minor defects in an excellent book, we would not be considered as wishing to under-rate it as a whole—for indeed, we can hardly speak too highly of its value as a means of strengthening at once the observant and the reflective faculties, and therefore we would commend it to all those about to begin the study of the medical profession.

ART. X.—*Die Krankhaften Geschwülste.* Von RUDOLPH VIRCHOW. Erster Band.—*Berlin*, 1863. pp. 536.

On Tumours. By RUDOLPH VIRCHOW. Vol. I.

THE doctrine of the cellular pathology, which emanated a few years ago from the Berlin school, and a knowledge of which has fallen within the reach of every one, thanks to the admirable translation of the original by Chance, has lately received a fresh impulse from the vigorous hand of its author; and Part II. of Virchow's 'Cellular Pathology," comprising a series of thirty lectures delivered at the Berlin Institute during the winter session of 1862–63, on the great subject of tumours, forms a sequel to a work which may well be regarded as the most elaborate and original of the present medical age.

Many of us who, during the past two years, have occasionally turned our thoughts from the more serious contemplation of pathology to the proceedings of the Prussian Parliament, must have noticed, with mingled feelings of regret and admiration, the name of Virchow among the leaders of the Fortschrittspartei; regret that he should be drawn from the great work which he, more than any living man, has furthered; admiration at the intellect that can grasp, and the untiring industry that can master simultaneously two so great and so dissimilar subjects as pathology and politics.

What is a tumour? Any attempt at a definition of this term is impossible. A very large group of morbid products was classified by our forefathers under this head; anthrax, furunculus, œdema, all being ranked as tumours. Indeed, at all times, the meaning of the word has depended essentially on the practical knowledge and the facilities for diagnosis possessed by the age; and the list of tumours has been curtailed in proportion as surer means of diagnosis have been arrived at. Even now, for instance, hydrocele is included in the list of tumours of the testicle, because frequently it can hardly be distinguished from sarcocele; though no one would think of calling a hydrothorax a tumour. The anatomical characters and origin of tumours constitute the only scientific basis of classification. The division that some would make into innocent and malignant is altogether unscientific. As well might you found a system of botany on the poisonous or nutritive properties of plants; when, in the same genus of plants, some are poisonous, others are nutritive; nay, more, when, in the same plant, one part is edible, another most deadly. By no means let us be ignorant of the physiology of particular tumours, or of the influence that this or that swelling will exercise on the body generally; but, as in botany and zoology, let us base our classification on anatomical characters, not on physiological relations. Again, the words *homologous* and *heterologous*, as commonly interpreted, are falsely applied to tumours. A homologous tumour is generally understood to be a tumour composed of elements which have a physiological prototype in the tissues of the body; a heterologous tumour to be made up of elements entirely dissimilar to those of any healthy tissue. But, inasmuch as specific tumour elements, differing entirely from those of the adult or fœtal tissues, do not exist, a heterologous tumour, according to the ordinary acceptation of the term, is an impossibility. He still employs the term, but in a different sense. Thus, for him, a homologous or homœoplastic tumour is a tumour whose structure is identical with the structure of the matrix in which it is developed (e.g., a cartilaginous tumour in cartilage); a heterologous or heteroplastic tumour differs in its structure more or less from the matrix in which it is contained (e.g., a cartilaginous tumour in the testicle).

The error of those (Barns and Broussais) who regarded all tumours in the light of chronic inflammatory processes, was a very pardonable one; for, in truth, there is no distinct boundary-line which separates so-called "products of inflammation" from tumours, and both are caused by the action of an irritant. The hyperplasia, or simple increased formative action, is more prominent, and gives rise to more startling results here than in inflammation, but is not a whit the less dependent on an irritant for its exciting cause than is the simple hyperplasia of inflammation. Now whence comes this "Reiz," this irritant, which is the *primum moveus* of every morbid process of the body? This question, which has always seemed to us to be unsatisfactorily answered by the cellular doctrine, is discussed in Lecture V.; and in answering it as summarily as possible in the words of Virchow, we will leave our readers to judge how far this irritant is demonstrable and how far it is merely hypothetical.

In the first place, the Reiz may come either from without or from within. He believes that in the great majority of cases it is external; first, from the fact that many tumours are directly traceable to injury or violence; secondly, from the circumstance that the greater number of malignant tumours are met with in those parts of the body which are most exposed to injury. He quotes from large statistics (collected among all classes and not from hospitals alone) of Tanchou, Marc d'Espine, and Virchow, to show that 80, 87, and 78 per cent. (according to the different results of the three observers) of all cases of cancer occur in the alimentary canal, the uterus, or the breast, those in the alimentary canal largely preponderating. Hence, he concludes that those organs, which have a soft surface and come most often into contact with foreign substances, are more liable to be the seat of cancer than organs which are enclosed and have no communication with external objects.

The history of epithelial cancers must be allowed by all to strengthen materially the argument in favour of a local irritant. No one can have been satisfied with the explanation hitherto given of the constitutional or blood cause at work in such cases. When we see that the direct contact of soot with a part will cause the worst form of malignant disease, ought we not rather to accept such a manifest local cause, which is visible and tangible, and try to apply it to the case of other forms of malignant disease, than be satisfied with a pure hypothesis in the form of a dyscrasia or refuge for the destitute?

Secondly, the reiz may come from within, and this brings us naturally to the great question of *constitutional tendency* or *diathesis*, concerning which he writes:

"I do not in the least hesitate to allow that we must, in the present state of our knowledge, refer the origin of many tumours to a peculiar condition of the blood. It would be impossible otherwise to account for syphilitic and some cancerous tumours. But, at the same time, in the great majority of cases, the change in the blood, the *dyscrasia*, must be regarded as a secondary phenomenon, due to the absorption of matter from some focus already existing, and the transfer of this matter by the lymphatics or veins. But, further, even in those cases where there is present in the blood a specific poison capable of irritating certain parts, and, by means of that irritation, setting on foot a formative action, it must still be allowed that the relations of the part itself, the intensity of the irritant, and the nature of the tissue affected, influence materially the effect produced. If it were not so, one could hardly understand why the poison of syphilis should cause at one time a simple hyperplasia of a part (as in exostosis), at another a true neoplastic formation differing altogether from the mother tissue (the gummy tumour)."

The changes which follow on the impression of the Reiz are familiar to all, being described at length in Part I.; the increased absorption of material, the swelling, the partition of the nucleus and cell till the indifferent stage, which he calls the *granulation stage*, is reached, where numerous cells are aggregated together, and where it is impossible to say what the tumour will become. Cancer and tubercle are now exactly similar in appearance (though probably in *appearance* only, for there may be an imperceptible something present that determines the future course of development). From this point begins the differentiation, and proceeds in one of two directions; either to the formation of a homogeneous mass, in which the cells are throughout identically the same, a *histioïd* or tissue-like tumour (e.g., connective-tissue or epithelial tumour), or to the production of a complex *organoïd* tumour, from a tendency in the different cells to take on different forms of development—some, for instance, to form connective-tissue, others epithelium. To such an extent may this heterogeneity of development proceed, that a perfect system of organs can be met with in the same tumour (cysts containing skin, sweat and sebaceous glands), and we may see before us a *teratoïd* tumour, though no longer a "τέρας" when thus explained.

The great importance of studying tumours in all periods of their life, from their development to their degeneration—a point so strongly insisted on by our great English authority, Paget—is urged by Virchow. Further, the examination of a fragment of any tumour is by no means sufficient to determine the character of the whole.

In Lecture VI., tumours are divided into—1. *Extravasation or Exudation Cysts*, i.e., cysts which contain extravasated blood or fluids that have exuded from the blood. 2. *Dilatation or retention cysts*, i.e., cysts formed by the collection of a retained secretion either in the gland itself from which the secretion comes, or in some part of the excretory duct. 3. Growths (gewächse), i.e., tumours proper.

Uncommon forms of the *hæmatomata* or blood-tumours are the *othæmatoma* or tumour of the ear, especially common in lunatics, supposed formerly to be the result of erysipelas, but now shown by Gudden to be due to direct violence. *Hæmatoma of the dura mater*, also common in lunatics, is an extravasation of blood from the delicate vessels of the false membranes that are formed beneath the dura mater as a result of chronic meningitis. Strange to say, he takes a similar view of the *uterine hæmatocele*—viz., that, excluding cases in which blood has escaped from some organ and gravitated into Douglas's pouch, the blood escapes from the vessels of false membrane which has resulted from previous peritonitis. He does not believe in the escape of blood from the tubæ, ovaries, and vessels of the broad ligament, after the manner described by French obstetricians.

Lecture VIII. treats of water tumours, of which *hydrocele of the tunica vaginalis* is taken as the type, and very fully described.

In Lecture IX., *hydrocephalus* and *spina bifida* are discussed. Hydrocephalus externus, or a collection of fluid in the so-called sac of the arachnoïd, does not exist, except in rare cases of congenital disease, where there is always some faulty development of the brain. The plan of the arachnoïd, commonly given and received, is false. There are dura mater, and pia mater—the membrane that invests the brain; but there is no intervening membrane to form a serous sac; the dura and pia mater simply lie in contact, and when separated one from the other, leave of necessity a space between them, but nothing that can be called a sac.

He speaks of certain rare forms of *meningeal hydrocephalus;* one in particular, in which œdema of the pia mater increases to such an extent that the membrane projects in the form of large cysts or bladder-like cavities; another, called "hygroma of the dura mater," where false membranes form on the inner surface of the dura mater, and become so soaked with serum as to project in parts like cysts. With regard to the spina bifida, by far the most common form is that in which the cord is itself involved, and runs across the sac to be inserted into its wall, the point of insertion being often indicated by an external depression or umbilication. Then follows an admirable description of the way in which the nerves, leaving the cord at the point where it is inserted into the sac, and describing curves with perfect regularity from behind forwards, terminate by perforating the dura mater anteriorly. Mention is made of *varicose dilatations of the central canal of the spinal cord.* A dilatation of this kind may reach such a size that the cord atrophies, and a spina bifida results in which the functions of the cord are completely lost. A short account of the acrania closes the chapter.

Lecture IX. is on *bursæ* and *ganglia.* The sheaths of tendons and the bursæ mucosæ are not regular serous sacs, which are developed with the rest of the body; but they owe their existence to the movements and consequent friction to which the parts containing them are exposed. Where they are found, there existed originally nothing but connective-tissue, which has suffered partial atrophy, and has left gaps or spaces that, in process of time, become independent cavities. They may be met with in the fœtus; but there, as would be expected, they are much less marked than in the adult; and it must be remembered the fœtus makes movements in utero. The bursæ formed by pouches of the synovial membranes of joints, which project beneath tendons in the immediate vicinity of joints, must of course be distinguished from the above.

In Lectures XI. and XII. the *retention cysts* are fully illustrated from the skin and mucous membranes respectively. Thus the *comedo,* the *milium* or *grutum,* the *molluscum,* the *atheroma* in the skin, have all their parallels in the mucous membrane. A good account is given of the small *mucous cysts of the stomach,* which are not uncommon in chronic inflammation of that organ. These are well seen with the microscope lying in the mucous membrane, and are evidently formed by dilatation of the gastric glands after obstruction of their ducts. Further may be included in the same category, though on a larger scale, *cystoïd distension of the processus vermiformis; Bronchiectasiœ. Trachea cysts* are occasionally met with; they occupy, as a rule, that part of the trachea which lies a little above and behind the manubrium sterni. The dilatation proceeds generally from the posterior wall; but as it cannot make way posteriorly, on account of the vertebræ, it extends laterally, and may thus appear above the clavicle as a distinct tumour, which may well be mistaken for a thyroïd cyst. *Ranula* is always a salivary cyst, produced by dilatation of the Whartonian or Rivinian ducts. *Seminal cyst:* the spermatozoa contained in this variety of cyst are not secreted in the cyst itself, as Paget suggests. Virchow supposes that the seminal cyst is formed out of a canal of the Wolffian body which has not followed its normal course of development and blended with the ducts of the testis to form the epididymis, but has remained in its fœtal state, and has undergone cystic dilatation. He further supposes that the spermatozoa have, as it were, regurgitated into the cyst from the common excretory duct of the testis. This is to be carefully distinguished from Morgagni's hydatid, or the remnant of the Müllerian duct in man. [For a remarkably clear account of these relations, we would refer the reader to 'Henle's Handbook of Anatomy,' vol. ii. p. 344.]

Lecture XIII. begins the history of the tumours proper, and deals with the *fibromata,* under which denomination he includes all tumours, warty and villous growths, condylomata, &c., which have for their basis substance connective-tissue. The *Elephantiasis Arabum* forms a sort of link between the fibroma and the simple inflammatory hyperplasia, and is described very fully. Of the same kind are *the diffuse fibroma of the breast,* or hyperplasia of the interstitial connective-tissue of the mammary gland; and *the fibrous hyperplasia of the ovary.*

The papillary or villous fibromata, of which the Pacchionian glands form the best illustration, spring most often from parts which normally possess papillæ, but may arise from any indifferent surface; in some the epithelial elements preponderating, in others the connective-tissue. In this group is classed the *Condyloma acuminatum,* but not the mucous tubercle, which will be better described in a later lecture. Two forms, from their interest, may be dwelt upon more at length. The first a disease for which he proposes the name *Fibroma molluscum,* and an illustration of which is seen in the woodcut to face the title-page. The disease is characterized by the formation of numerous tumours, varying in size from that of a pea to that of a mass weighing several pounds, having a smooth surface, and of a softish consistence. The larger ones occupy the subcutaneous tissue, and are composed of a juicy, slightly vascular, loose connective-tissue, arranged in form of a close-meshed network, from which, on section, a yellowish fluid, rich in albumen, can be expressed, and in which the connective-tissue corpuscles are very numerous and large; the smaller ones are seated in the very substance of the cutis, have on section a pale yellow colour, and are made up of an actively-growing granulation tissue rich in cells. The second disease is the *Fibroma of the kidney,* which is met with in form of a greyish-white, rather transparent spot, of about the size of a pea, seated, for the most part, about the middle of the kidney, near the base of a pyramid. It is a localized hyperplasia of the matrix, with consequent atrophy of the tubules, and is apt to be mistaken for tubercle.

The *Lipomata* or fatty tumours come next in order; and in the following lecture we find a full history of the *Myxoma*, Schleimgeschwulst, or mucous tumour. The special characters of the mucous tissue, which forms the basis substance of this tumour, are described in the Fifth Lecture of Part 1. It will be remembered that the tissue of the umbilical cord, the vitreous body of the eye, and the subcutaneous tissue of the embryo are all made up of this same schleimgewebe, which is closely allied to connective-tissue and fat, but differs from both of them in the peculiar, transparent, gelatinous, flickering substance that is contained in its meshes: that this substance yields chemically *mucine* precipitated from solution by both mineral and vegetable acids, but insoluble in excess of vegetable, readily soluble in excess of mineral acids. The myxoma bears to the mucous tissue exactly the same relation as the fibromata and lipomata bear to connective-tissue and fat respectively. Perhaps the simplest form that exists is met with in the disease of the villi of the chorion, known under the name of "hydatid mole," the several little bodies of which are not cysts or vesicles, but villous outgrowths of this mucous tissue soaked with fluid; and it is the peculiar softness of the contents that gives rise to the deceptive appearance of cysts. Their analogy with the condylomata of the skin and the villous tumours of the mucous membrane is close. The more hetero-plastic forms of myxoma (though only hetero-plastic in a restricted sense, for the connective-tissue is so nearly allied to the mucous) correspond exactly to the fibro-cellular tumours, whose history and description are so perfectly given by Paget. According to Virchow's experience, their most frequent seat is the thigh, and, next to the thigh, the neck, about the angle of the jaw. Their *point de départ* is, generally, the deep sub-fascial or intra-muscular connective-tissue; but they may be subcutaneous, and are then apt to project and become pedunculated. They are occasionally met with in the brain, where they spring from the neuroglia, and are remarkably soft. [We saw a beautiful specimen of this at a post-mortem examination made in the Institute by Virchow, some three years ago. The tumour occupied the greater part of the right hemisphere, projecting above, so as to cause partial absorption of the inner table of the cranium, and bulging out below into the lateral ventricle. Before section, it fluctuated most perfectly; but on section, was seen to be a soft, gelatinous mass, in part greenish-yellow, in part whitish, and richly supplied with blood-vessels, some of which had burst, and caused partial extravasations. A very complete account of it, under the title of 'Myxoma,' was given at the time by the professor.] Another common seat is in the bones, especially the jaw. Stanley's tumour, at p. 181 of his book, was of this kind. Again, they may spring from the perineurium, and form swellings which closely resemble the neuromata, but are essentially different. They occur, too, in the breast, where they are generally described by writers under the head of cysto-sarcoma. They are not seldom compound, being mixed most often with cartilage and osteoïd tissue. Lastly, they are, as a rule, innocent, but may be very malignant, especially when growing in connexion with nerves.

Vol. I. concludes with Lecture XVI., on *cartilaginous tumours,* which are divided into *enchondroses*, or simple cartilaginous outgrowths, and *enchondromata,* or cartilaginous tumours. The latter are again subdivided into the enchondromata proper and the *osteoïd chondromata.* This osteoïd chondroma is very malignant, but not always so. Its description tallies exactly with that of the osteoïd cancer in Part II. of Paget's book; and it corresponds to a part of the tumours called by J. Müller malignant osteoïd (*bösartiges osteoïd*).

Want of space compels us to postpone to a future number a notice of the remaining fourteen Lectures comprised in Vol II.[1]

Art. XI. — *On the Phenomena of Hybridity in the Genus Homo.* By Dr. Paul Broca. Edited, with the permission of the author, by C. Carter Blake, F.G.S., &c. 1864.—pp. 71.

This is an able essay on a very difficult and much-contested subject. The translation of it we cannot equally commend, though made, as we infer from the preface, by the honorary secretary of the Anthropological Society of London, for which the treatise is published.

Dr. Broca discusses the great question of the races of man with at least the appearance of perfect partiality. The conclusions he arrives at are the following:

"1. That certain intermixtures are perfectly eugenesic.

"2. That other intermixtures are in their results notably inferior to those of eugenesic hybridity.

"3. That mulattoes of the first degree, issued from the union of the Germanic (Anglo-Saxon) race with the African negroes, appear inferior in fecundity and longevity to individuals of the pure races.

"4. That it is at least doubtful whether these Mulattoes, in their alliances between themselves, are capable of indefinitely perpetuating their race, and that they are less prolific in their direct alliances than in their recrossing with the parent stocks; as is observed in paragenesic hybridity.

"5. That alliances between the Germanic race (Anglo-Saxon) with the Melanesian races (Australians and Tasmanians) are but little prolific.

"6. That the mulattoes sprung from such intercourse are too rare to have enabled us to obtain exact particulars as to their viability and fecundity.

"7. That several degrees of hybridity, which have been observed in the cross-breeds of animals of different species, seem also to occur in the various crossings of men of different races.

8. That the lowest degree of human hybridity, in which the homœogenesis is so feeble as to render the fecundity of the first crossing uncertain, is exhibited in the most disparate crossings between one of the most elevated and the two lowest races of humanity."

These conclusions, judging from the evidence from which they are derived, are specious; yet we cannot receive them as proved and unquestionable truth—indeed, the author himself does not seem to make this claim for their reception. When entering on the subject of the intermixture of races not eugenesic he says:

[1] This work of Professor Virchow's we would respectfully commend to the notice of the New Sydenham Society.

"The facts I intend to exhibit tend to prove that it was a great error to consider all intermixtures of men as eugenesic. Obliged as I am to refer to testimonies which perhaps do not always exhibit a desirable precision, some doubts may hang over my conclusions. Thus much, however, will result from this sketch, that the examination of the laws of hybridity is far from being favourable to the doctrine of Monogonists."

This doctrine, we need hardly remark, Dr. Broca is decidedly opposed to. Whilst he admits that the different races of man constitute one genus, he holds that it would be a single exception in creation if they consisted of one species only. And whilst maintaining the reverse—that this human genus is, like the other genera of animals, complex, he insists that, "in the greater number of genera, the various species differ much less from each other than certain human races."

This brief notice, and these few extracts, will convey to our readers some imperfect idea of Dr. Broca's treatise. Our limits do not permit us to enter into a more detailed account of it. We will only add, that whilst many of his statements, and many of his arguments, appear to us unsatisfactory, we cannot but admire the philosophical spirit which is displayed in producing them. With this feeling in favour of the essay, we recommend it strongly for perusal to those who are interested in the great question at stake; and especially so to those who hold the contrary doctrine—the Monogonists—of whom there are so many and able followers of Darwin, who should be ready to enter the lists.

ART. XII. — 1. *Morbus Coxarius.* By LEWIS A. SAYRE, M.D., Surgeon to Bellevue Hospital, &c.—*New York*, 1863. pp. 24.

2. *A New Operation for Artificial Hip-Joint in Bony Anchylosis.* Illustrated by two cases. By LEWIS A. SAYRE, M.D., New York.—*Albany*, 1863. pp. 19.

DR. SAYRE is well known here from his advocacy of tenotomy in the more advanced stages of hip-disease. The former of the two pamphlets which we have named above, embodies this author's views on that subject, but contains also a general view of the symptoms of the disease. This tract is not by any means ill done. Considering the very brief space (sixteen very small pages) into which Dr. Sayre has compressed the account of the symptoms and treatment of the earlier stages of the complaint, the matter is ably handled; and some of the observations which our author makes are well worth consideration. Here is one which we have often had occasion to make ourselves, but which we do not remember to have ever seen in print before:

"That morbus coxarius may arise in a child whose constitution is uncontaminated by hereditary taint, and who is perfectly healthy, the observations of every day fully substantiate. I believe that many have attributed the source of this disease to a strumous origin simply from the *appearance* of the patient, whose emaciated, spanæmic condition is regarded as the *cause*, when it is in reality the *effect* of the disease. I have seen children of perfectly healthy constitutions in whom the disease arose from an evident traumatic cause." (p. 2.)

When Dr. Sayre, however, goes on to say that the disease is never produced by a constitutional predisposition only, but always requires some extraneous cause, such as violence or exposure, we are unable to accept the doctrine, from the great difficulty of verifying it. There are few children in whom such a cause may not be alleged, but it can rarely be proved to have really had any effect. In the matter relating to diagnosis, Dr. Sayre has gone into needless refinements, and has even advanced some statements in the highest degree problematical—as where he says that in sacro-iliac disease elongation of the limb will be found "dependent on the displacement of the diseased ilium itself, which is tilted forwards and rotated, or slipped downwards, owing to the swelling and destruction in the affected articulation." (*sic*, p. 5.)

We disbelieve the occurrence of any such displacement of the ilium. In the first place, we never saw a case in which this disease had proceeded to the *entire* severance of the connexion between the ilium and sacrum; and, secondly, even after such an event the ilium would be prevented from slipping down by the symphysis pubis. Evidently in this description Dr. Sayre has been drawing on imagination rather than observation. There is also a good deal that is superfluous in the elaborated diagnostic symptoms given to distinguish hip-disease from "fracture and diastasis of the head of the femur," from dislocation of the hip in various directions, from abscess and periostitis of the femur. But the chief point in Dr. Sayre's pamphlet is the treatment of the disease. In the first stage, Dr. Sayre has recommended a new form of splint. As to this we can say little. It appears the fashion now for every succeeding writer on hip-disease to recommend a new splint, but it does not appear that one splint effects much more than another. However, experience is necessary before an opinion as to the relative merits of each can be formed. The treatment of advanced stages of the disease by section of the contracted muscles is the matter in which Dr. Sayre's practice appears chiefly to differ from that usually adopted. Dr. Sayre maintains that there are conditions of hip-disease in which the muscles are the parts chiefly affected, and that these muscles become structurally altered and incapable of elongation; that in such cases the spasmodic contraction of these diseased muscles aggravates the pain in the joint by pressing the inflamed articular surfaces together, while extension applied to the limb also aggravates the pain, by stretching the diseased muscles. It is in such cases that Dr. Sayre finds great benefit from sub-cutaneous division of such muscles as he finds, by examination under chloroform, to be permanently contracted. Mr. Barwell, in some recent papers on the same subject, proposes to accomplish the same object by the continuous gentle traction of india-rubber bands. We believe Dr. Sayre's method would be found preferable in those very rare cases where either is requisite; for we must be allowed to doubt whether the condition which Dr. Sayre has described occurs, unless in the most exceptional cases. Dr. Sayre says (with a disregard for grammar which we grieve to say distinguishes the whole of his pamphlet), "I use the term *contracted* to express a shortened muscle, but which is still capable of being extended; and *contractured* when it has undergone structural shortening, and is incapable of being elongated—similar to Barwell." Dr. Sayre means, of course, that his phraseology is similar to that of Barwell—perhaps he should have said adopted from that author; but we need not inquire which writer has to defend himself from the imputation of inventing this hideous and unnecessary term. We doubt very much that the condition of the muscles often opposes any grave obstacles to the treatment of hip-disease; and that it ever opposes any insuperable obstacles we can only believe when the structural change has been anatomically demonstrated. But when spasmodic contractions are unusually violent and painful, and when the contraction can be plainly distinguished while the child is under chloroform, we should adopt Dr. Sayre's plan as the one most likely to afford immediate relief.

Dr. Sayre's other pamphlet contains an account of two cases of bony anchylosis of the hip treated by section of the neck of the femur. The peculiarity of the operation which he employed in each case was, that he cut out a concave piece of bone from the femur with the concavity looking downwards, and rounded off the upper end of the divided shaft, so that it might play in the upper cup-shaped portion of the head. The object of this proceeding was to form a ball and socket, and thus to imitate the natural hip-joint; but whether there is any great importance in the precise shape of the piece of bone removed appears to us highly doubtful. Dr. Sayre's own drawing (p. 17) of the state of the parts, seems to show that the lower end of the femur was quite smooth some months after the operation, and united to the upper by a band of fibrous tissue. The essence of the operation appears to consist in cutting out enough bone to allow of the limb being brought easily into the straight line. The account of the fatal case of this operation, and a description appended of the dissection of a false joint of the ununited fracture of the ulna, are interesting as showing the reproduction of true cartilage in these new articulations. In all previous instances, where the cartilaginous-looking material encrusting the ends of the bones has been examined, it has turned out to be merely fibroïd tissue. Dr. Sayre's cases, if supported by future investigations, will show that it is not impossible for true cartilage to be formed in the new joints left after resection, a point of some interest both in a physiological point of view and in practice, inasmuch as it would give a better guarantee for the ease and permanence of motion in the joint.

ART. XIII.—*Researches upon the Anatomy and Physiology of Respiration in the Chelonia.* By S. WEIR MITCHELL, M.D., and GEORGE MOREHOUSE, M.D.—*Philadelphia*, 1863. pp. 42.

THE authors begin their dissertation in a manner very creditable to them, by doing justice to an English inquirer of the latter part of the last century, Robert Townson, whose researches on the subject appear to have been strangely neglected by anatomists and physiologists, and most undeservedly, as in point of correctness his results, it is shown, were more accurate and more free from error than any afterwards published, not excepting those of distinguished names and of leading and living authorities.

Their dissertation, one of the "Smithsonian Contributions to Knowledge," and published by the Smithsonian Institution, consists of two parts, one anatomical, the other physiological. Both afford good examples of careful examination and description, and of well conducted experiments and just reasoning. Taken as a whole the results are interesting and instructing; and the latter especially in one point of view, as showing how men of the highest authority may make mistakes when trusting too much to analogies.

The following are the ascertained points to which the authors desire to call attention as new; and receiving them as such, they must be allowed to be a very valuable addition to comparative zoology :—

"1st. In Chelonians the superior laryngeal nerve is distributed both to the opening and closing muscles of the glottis.

"2nd. The inferior laryngeal nerve is distributed solely to the opening muscle of the glottis.

"3rd. A true chiasm exists between the two superior laryngeal nerves.

"4th. The expiratory muscle lies within the breast-box, and consists of anterior and posterior bellies connected by a strong tendon continuous across the middle line, and common to both sides of the animal.

"5th. The inspiratory muscles occupy the flank spaces on either side.

"6th. Inspiration is effected by the contraction of the flank muscles, which in appearance strongly resemble the diaphragms of superior animals.

"7th. Expiration is effected by the consentaneous action of the four muscular bellies above described, which thus compress the viscera against the lungs. The act of respiration consists of an expiration and an inspiration, during which the glottis remains open.

"8th. The opening of the glottis is effected through the agency of the superior and inferior laryngeal nerves, both of which are distributed to the dilating muscle of the glottis. The superior laryngeal nerve presides over the closure of the glottis, being in part distributed to its sphincter muscle. The elastic contractility of the glottic cartilages aids in closing this orifice. After section of the superior laryngeal nerves, the glottis may still be opened by the agency of the inferior laryngeal nerves, its imperfect closure being then effected by means of the elasticity of its cartilaginous lips. The chiasm of the superior laryngeal nerves enables one of these nerves to open and shut the glottis after section or disease of the opposite nerve, and of both inferior laryngeals.

"Physiologists have therefore been in error when describing the respiration of Chelonians as analogous to that of Batrachians, since it more closely resembles the breathing of the higher vertebrates."

A wish is expressed by the authors in their Preface—a very desirable one :

"That the novel views they have brought forward may induce comparative anatomists and physiologists to examine afresh the respiratory mechanism of other reptiles, and also of birds—a labour they indulge the hope of sharing."

Art. XIV.—*The Restoration of a Lost Nose by Operation.* Exemplified in a series of cases, illustrated with wood-engravings. By J. Hamilton.—*London*, 1864. (Pamphlet.)

This interesting pamphlet records an extraordinarily large experience of the somewhat rare operation of rhinoplasty. Mr. Hamilton intimates that, before his operations, this proceeding was almost unknown in Dublin, one case being all that he could find out, and that case having terminated in deformity almost worse than what existed before the operation. Mr. Hamilton, however, has now operated on ten cases, and all have been successful—unusually so, if we may judge by the portraits which are inserted in the pamphlet before us. This great success certainly warrants Mr. Hamilton in recommending the operation to greater favour than it at present enjoys. Many surgeons (perhaps we might say most) are under the impression that, by a little ingenuity in modelling, a false nose can be made which will represent more nearly the shape of the natural organ than anything which can be fashioned out of the skin of the patient, and this can be painted so as very nearly to imitate the natural colour. We well remember a woman who used to model and paint for herself a false nose, which made so good a substitute for that which she had lost, that the surgical staff of a large hospital, to which she applied for advice, unanimously decided that nothing which plastic surgery could accomplish could hope to rival the patient's own handiwork. But this cannot always, or even commonly be effected; so that we regard Mr. Hamilton's pamphlet as a very seasonable contribution to operative surgery, for many of these cases are abandoned which might be much benefited if the operation should turn out as well in the hands of others as in his. We notice with pleasure that Mr. Hamilton has found the new feature acquire additional thickness and prominence with time—a very important consideration in the case. The shrivelling which Mr. Skey has dwelt on as one of the drawbacks to the operation is attributed by Mr. Hamilton to that surgeon's plan of taking the new integument from one side of the forehead, which requires too long a pedicle, whereby the vitality of the transplanted flap is reduced. In thinking over this subject, we have never quite understood why the old method of Taliacotius has fallen into disuse. It would appear (theoretically at least) to involve less risk of sloughing to deal with more healthy parts and thicker skin, and to have the merit of at any rate not extending the deformity, as the large frontal wound might easily do. Perhaps, however, the inconveniences in its practical application might be less easily surmounted than appears before trial.

Art. XV.—*Medicinskt Archiv, udgivet af Lärarne vid Carolinska Institutet i Stockholm.* Redigeradt af E. A. Key, C. J. Rossander, och A. Kjellberg. Första Bandet, tredje Häftet.—*Stockholm*, 1863. 8vo, pp. 270.

Archives of Medicine, published by the Lecturers in the Carolinean Institute in Stockholm. Edited by E. A. Key, Professor of Pathological Anatomy; C. J. Rossander, Professor of Surgery; and A. Kjellberg, Adjunct in Pædiatrics. First Volume, Second and Third Numbers.

In our thirty-second volume, p. 149, we announced the appearance of the first issue of the above work, and we briefly mentioned the proposed plan of its publication. Since that time two additional numbers, completing the first volume, have reached us. On the title-page of the third part the name of Dr. Troilius[1] has been replaced by that of Dr. Kjellberg, as one of the editors. The papers contained in the second and third numbers are the following: "On Uterine Hæmorrhages after Delivery and during the Puerperal State," by A. Anderson; "On Coremorphosis," by J. Björkén; "On the Various Forms and Development of the so-called Tubular Casts in Diseases of the Kidneys," by E. A. Key; "Studies and Investigations upon Bony Tissue, chiefly with reference to its Development," by Christian Lovén; "On Abortion," by Ragnar Bruzelius; "Notes of a Foreign Scientific Tour," by Adolpf Kjellberg. The average length of each paper is about one hundred and four pages.

Coremorphosis (derived from Κόρη, pupil, and μόρφωσις, shaping), is considered by Dr. Björkén, under the heads of Coretomy or Iridotomy, division or incision of the iris; Corectomy or Iridectomy, excision of a portion of the iris; Coredia lysis or Iridodialysis, separation of the iris from a part of its attachment; and Corectopia, or displacement of the pupil. His essay contains an admirable historical and practical investigation of the whole subject, forming one of those useful and exhaustive treatises for which our Scandinavian colleagues are so remarkable.

Of the remaining papers which we have enumerated one of the most interesting is that by Professor Key upon tubular casts in the kidneys. It is illustrated by two well-executed plates. The paper is divided into two leading parts. In the first, the author treats of changes of the epithelial cells, which he reduces to the following principal forms: 1, the dark granular; 2, the clear granular change;

[1] We regret to see, in the 'Hygiea' for May, 1864, which has just reached us, an account of the death, from phthisis pulmonalis, of Dr. Troilius. This melancholy event occurred on the 5th of January last at Melbourne, where he had arrived, in search of health, only five days previously. Dr. Troilius was a physician of great promise. His inaugural thesis, on Uræmia, was noticed in the twenty-sixth volume of this Review, p. 168. In 1861 he visited, among other countries, Great Britain and Ireland, and a full report of his tour, in its medical and scientific bearings, was published in the 'Hygiea' for the following year. Dr. Troilius would not have completed his thirty-first year until December next.

3, fatty degeneration; 4, gelatinous change; 5, wax-like degeneration; 6, pigment change; and 7, impregnation with calcareous salts; and lastly 8, shrivelling of the cells. In addition, he mentions as a ninth form, atrophy, as distinguished from shrivelling of the cells; but observes that the four varieties last enumerated are of comparatively little importance in renal pathology.

Tubular casts he divides into: 1, dark granular cylinders; 2, clear, finely granular cylinders; 3, fat cylinders; 4, calcareous cylinders; 5, blood cylinders; 6, gelatinous cylinders; 7, wax-like cylinders; 8, hyaline cylinders, with two subdivisions; *a*, hyaline gelatinous; and *b*, hyaline wax-like.

Herr Lovén's treatise upon ossification displays great research and learning. The essay of Herr Bruzelius upon abortion is highly practical. On the whole, we can congratulate the editors of the 'Swedish Archives of Medicine' on having given to the profession a volume of most valuable memoirs.

Art. XVI.—*A Manual of Minor Surgery.* By John H. Packard, M.D., Demonstrator of Anatomy in the University of Pennsylvania, one of the Visiting Surgeons to the West Philadelphia Military Hospital, &c. &c. Authorized and adopted by the Surgeon-General of the United States Army for the use of Surgeons in the Field and General Hospitals.—*Philadelphia*, 1863. pp. 288.

A few years ago M. Jamain brought out a 'Manuel de Petite Chirurgie,' to meet the wants of students preparing for examination before the Faculty of Medicine at Paris. As far as we know, this was the first time that minor surgery formed the subject of a separate treatise. The example thus set was soon followed in this country by Mr. Christopher Heath; and now we are called upon to notice a similar work published in Philadelphia. That there is room for such books, and that they are likely to be useful, can hardly be doubted. There are many subjects, such as bandaging, dressing, &c., upon which the comfort of patients largely depends, which are not described or explained in treatises on surgery. It is taken for granted that the reader is acquainted with such matters—that he knows how to make an issue or apply a spica bandage. It seems hardly worth while to spend time and space on such things when there are other subjects of much greater importance to be discussed. And yet the manner in which the surgeon carries out these details goes far to influence the opinion which is formed of his skill, and not unfrequently plays a conspicuous part in the history of the case. How often may we observe that the way the after-treatment is conducted is of greater importance than the way in which the operation was performed! How desirable, nay, how essential it is, after an operation, that every little thing should be done which can save the patient from pain, soothe his mind, husband his strength, improve his health, and hasten his recovery! We do not speak of medical treatment, properly so called, but of such matters as the cheerfulness and ventilation of his room, the arrangement of his bed, the application of splints, and the like. Who can estimate the influence these things have on the issue of the case? We are inclined to regard them as trifles, and as such we are apt to neglect them; but trifling causes, in constant operation, lead to mighty results. And where is the medical man, young and without experience, just entering on practice, to get information on these subjects? Much may be learnt by attending to the clinical teaching in any well-ordered hospital, and by picking up the scraps of traditionary lore that fall from the lips of the visiting surgeons. But students too often neglect these opportunities; and practitioners, for obvious reasons, cannot make use of them. It is true, many excellent hints may be found scattered throughout the text-books on surgery, but the difficulty is to lay hands on them when they are wanted. This then is what manuals of minor surgery propose to do for us: they do not profess to contain anything that is new; they only gather up the fragments of knowledge which might otherwise be lost among more important matters, and arrange them in a form which makes them easily accessible. They give us chapters on bandaging, on dressing, on the choice and application of splints, on the duties of assistants, &c., as well as instructions for performing the smaller operations. It is, however, no easy matter to define the exact limits of minor surgery. In this country the term is held to include all that a house-surgeon is required to do on his own responsibility—dressing wounds, setting fractures, performing small and also "emergency" operations; but even this distinction would admit of considerable variation according to the usages of different hospitals. We quite agree with our author, that "here as elsewhere, in dealing with medical subjects, it is hard to draw a precise boundary-line, and better to overstep it than to fall short of it." But the most serious fault that we have to find with Dr. Packard is, that he has fallen so far short of the boundary-line, and omitted so many things which appear to us to come under the head of minor surgery.

The volume before us is addressed specially to military surgeons, and has been "adopted by the Surgeon-General of the United States army;" but, at the same time, it is intended to meet the wants of civil practitioners. In reading it we have been struck by observing the general similarity which exists between surgical practice in America and in this country. Between the two there appears to be no difference of any moment. This is very satisfactory, and serves to show how wide-spread is the basis of observation and experience upon which our present practice rests.

As we might expect from the position which Dr. Packard occupies, the information contained in his manual is, as far as it goes, sound and useful. Two or three of his suggestions are new to us. Of these, the most noticeable is the author's plan of extending the leg by means of an elastic band fastened to the sole of the foot, and passed over a pulley fixed at the lower end of a long splint. In this way a constant and equable force, capable of being graduated, is exerted on the limb. It is a method which might be tried with advantage in many cases besides fractures—as, for example, in contractions of the hip or knee, particularly in children.

Some things have been mentioned by our author which might well have been left out. Among these we may enumerate the "spring lancet," the "mechanical leech," the application called "water-glass," the anæsthetic "kerosolene," and the description of cupping entire limbs. These are refinements which, to say the very least, are still on their trial, and which one would hardly expect to find in a manual of minor surgery especially intended for field practice!

But, as we said before, Dr. Packard has omitted several topics which, from our point of view, ought properly to have a place in his book. Granting that the limits of his subject are very uncertain, and that one must not exercise too severe a criticism in this respect, still, ought not laryngotomy and tracheotomy, excision of the tonsils, paracentesis, and division of the frænum linguæ to be mentioned in the chapters on minor operations? Ought not the diagnostic signs of compression and concussion to be enumerated? Ought not the treatment of retention and extravasation of urine to be briefly explained? Ought not the young surgeon to be told how to deal with a strangulated hernia, a prolapsus recti, or a cut throat? Ought there not to be a chapter on poisoning, including the use of the stomach pump, and the treatment of cases of suspended animation, as from hanging or drowning? Ought not the treatment of epistaxis, of scalds and burns, of bites and stings, to find a place somewhere? Ought there not to be a notice of plaster-of-Paris, gutta-percha, leather, gum-and-chalk splints, with an estimate of their relative value, and the mode of preparing each? These are some of the most conspicuous omissions that we have observed. We could point out others, but we have said enough to justify the opinion we have expressed; and we have no doubt that our readers will agree with us that most, if not all, of these subjects fall properly within the limits of minor surgery. It is true some of them are very trifling; but an author who thinks it worth his while to describe and figure the lancet, probe, &c. which every surgeon carries in his pocket-case, can hardly say that anything is beneath his notice. Besides, some of the points we have enumerated are far from trifling, and though they belong to minor surgery, are not without their importance.

On the whole, we are inclined to think that Dr. Packard's manual has been hastily prepared, without any preconceived plan, and that this has prevented him from doing justice either to himself or his subject. Such, at least, is the impression that we have derived from a careful perusal. When a second edition, "revised and enlarged," makes its appearance, we hope that the omissions we complain of will be corrected, and that the points we have mentioned will no longer be passed over unnoticed.

The illustrations are good; but we cannot say as much for the index. Instead of being full and ample, as it ought to be in a book of reference, it is extremely meagre and unsatisfactory.

Art. XVII.—*Phthisis and the Stethoscope; or, the Physical Signs of Consumption.* By Richard Payne Cotton, M.D., F.R.C.P., &c. Third Edition.—*London,* 1864. pp. 104.

Our readers will probably remember that in reviewing a former edition of this compact and practical handy-book we took occasion strongly to recommend it. The present edition contains an introductory chapter on the classification and nomenclature of the physical signs afforded by the lungs when diseased, the French mode of classification being more adhered to than the English, as being more simple in character. Moreover, in accordance with a suggestion of our own, the author has introduced an additional chapter on the physical signs "indicative of arrest or improvement in the pulmonary disease." We do not know of any work likely to prove a more useful guide to the student in his first experiences of the teaching afforded by our hospital wards, or a better standard for reference on the topics treated therein during after years of his professional life.

Art. XVIII.—*Traité Pratique des Maladies des Yeux.* Par Wharton Jones, Professeur d'Ophthalmologie à University College Hospital, à Londres. Traduit par M. Foucher.—*Paris,* 1862. pp. 738.

Practical Treatise on the Diseases of the Eyes. By Wharton Jones. Translated by M. Foucher.

This French edition of Mr. Wharton Jones's useful little book is well translated, and has much to recommend it. After translation, the whole has been submitted to the careful revision of a surgeon well versed in diseases of the eye, and to whom, as editor, its appearance is due. But a great advantage of this edition is, that it has, in anticipation of the next edition of Mr. Jones's manual, his own corrections and additions, so that in this sense the work now published in French is called the *third* edition. The improvements which Mr. Jones proposed to make in a future English edition have been communicated by him to the French professor, so that the present edition will not only be an advantage to our *confrères* abroad, but should be read by our English students of ophthalmology. An additional recommendation of the French edition is, that it is much cheaper than the English one, although the coloured plates and woodcuts have been re-engraved in Paris, with very many additional figures introduced.[1] The plates seem to us to be hardly so well coloured as in the English edition; but there

[1] Remembering the fact of the cheapness of the French publication, it strikes us as rather surprising that English authors do not more frequently employ the artists of Germany and France for the illustration of their works, which would thus be at least as well done as in England, and at much less expense, for it appears that it was found more economical to reproduce the coloured plates of the work in question in France, than to incur the cost of the number required to be printed from the English originals.

are three ophthalmoscopic figures, which, although not very good, are more trustworthy than the one figure, whether representing amblyopia or any other disease of the fundus oculi, which accompanies the English text. The woodcuts, whether copied from Mr. Jones or original, are as good as those in the original work. Some pathological specimens are illustrated by sections. With regard to the literary merit of the work, whilst we point out the advantages of having obtained the latest emendations of the author, we would not overlook the importance of the bracketed notes and other considerable additions of the editor, M. Foucher, which refer to the most recent improvements that have been made in the treatment of glaucoma and amaurosis, those names in themselves hitherto so unmeaning, and in the diagnostic use of the ophthalmoscope. Many of the notes of the editor represent also the French element in ophthalmological science, and should therefore be well considered by English students. With so much that is satisfactory in the French new edition of Mr. Jones's manual, there are some parts which appear to us to come short of what such a work should be. Thus, the treatment of lachrymal obstructions is considered chiefly with regard to the use of styles and tubes, and at greater length than we think the treatment deserves; but the editor has not altogether ignored the great improvement effected by Mr. Bowman in the treatment of these cases without the necessity of wearing an instrument of any kind. The probing system is undoubtedly tedious, but is on the whole, we are inclined to think, far superior to any other yet suggested. As for the old-fashioned styles and tubes, we believe that at the Moorfields Hospital they have not even cared to preserve a specimen of the clumsy contrivances. M. Foucher, however, says, "this (Bowman's) method has the advantage of not requiring the skin to be opened, and of affording a permanent opening, which allows of a return to the dilating procedure, if necessary." We are sorry to see the chapter on the operation for displacement of cataract given at length, or, if it must be given, without at any rate more special warning of the dangerous nature of the whole proceeding. M. Foucher sees no advantage over other operations for cataract in that lately introduced by M. Schuft (Waldau). He says: "This proceeding seems to us to produce too much havoc for a result otherwise to be obtained." No account is given of Mr. Hutchinson's investigations as to the causation of the keratitis, hitherto called strumous, and which he has so clearly connected with inherited syphilis. His work is merely referred to, as it is given, second hand, in the 'Annales d'Oculistique.' M. Foucher would only employ inoculation for pannus in those cases in which there is complete blindness, by which we presume he means only that approach to blindness produced by extreme pannus, not that he would only inoculate when, from other disease, there could be no hope of restoration to sight; for, of course, the patient is never completely blind from pannus alone.

ART. XIX. — *Outlines of Surgical Diagnosis.* By GEORGE H. B. MACLEOD, M.D., F.R.C.S.E., Fellow of the Faculty of Physicians and Surgeons, Glasgow; Lecturer on Surgery to Anderson's University; Surgeon to the Glasgow Infirmary, &c.—*London,* 1864. 8vo, pp. 543.

THIS book has the merit of being exactly what its name imports. It is a treatise on surgical diagnosis. It is not a system of surgery, for it neither includes pathology nor treatment. These subjects are only incidentally mentioned, and do not enter into the plan of the work.

The author takes his stand on the maxim, "qui sufficit ad cognoscendum, sufficit ad curandum." Certain it is that we cannot lay too much stress on the necessity of an accurate and precise diagnosis. Until we have clearly made out the nature of the case before us, prognosis must be impossible, treatment must be empirical, and the result will most probably be unsatisfactory. We hail, therefore, as a useful addition to our professional literature any book which helps us to recognise and to distinguish diseases. It is with this view that Dr. Macleod has set forth the diagnosis and differentiation of those affections which fall under the care of the surgeon. This he has done in clear and simple language, and in a way well suited to show the points of similarity and the points of contrast. He has chosen the alphabetical arrangement. Each subject finds a place according to its initial letter. The work opens with "abscess," and closes with "veins." The author is well aware of the disadvantages attending this mode of arrangement; but he has endeavoured, as far as possible, to meet them by the addition of a full and copious index.

At the outset of his work Dr. Macleod explains, in an introductory chapter, the various means of diagnosis at our disposal, and the relative value of each. The newest instruments and the most recent methods of investigation are mentioned, and their application explained, so that the "science of diagnosis" is brought up to the level of our present knowledge.

The 'Outlines' contains, as we have said, neither pathology nor therapeutics. It is not, therefore, suited to take its place among systematic works on the principles and practice of surgery; but it is likely, we think, to prove of much use to the student or to the practitioner who finds himself perplexed by the number of diseases which present somewhat similar appearances, and who desires a short and pointed statement of the symptoms and diagnostic marks of each. The hospital surgeon, too, whose business it is to demonstrate the means of recognising and distinguishing diseases, will find those points which ought to form the basis of clinical instruction clearly set forth in Dr. Macleod's pages.

This volume was not put into our hands until a very late date, when the space at our disposal was limited. Under other circumstances, we would gladly have given our readers a fuller account of a book which is well worthy of their attention.

Art. XX.—*Journal of the Scottish Meteorological Society for the Quarter ending 30th September*, 1863. New Series, Nos. 1 and 2, January, 1864. pp. 102.

This 'Journal of the Scottish Meteorological Society' is of great promise, and we feel a proportional interest in it and its continuance.

The society is one of those excellent ones which are self-supporting, unaided by Government, and founded solely for the purpose of advancing science, and, by the extension of exact knowledge, of contributing to the progress of the arts and the well-being of our fellow-men.

In the first instance, this society was instituted mainly for the purpose of affording aid to agriculture. Now, we are glad to see that it is less restricted, and that its views are so enlarged that medical climatology is comprised in them. For this latter purpose, it appears from a minute of Council that a permanent committee has been formed, and has commenced its requisite functions.

The brief prospectus which has been put forth well shows the large scope of the society's intents—viz.:

"To investigate Scottish meteorology, and particularly to ascertain the leading features of the climate of different districts of the country; to point out the bearings of meteorology on public health, and on the prevailing diseases affecting crops and live stock; to investigate the origin, progress, and recurrence of storms in Scotland; to point out the differences between the peculiar climate of Scotland and that of other countries; to ascertain the causes of the peculiar climate of Scotland in summer as well as in winter; to investigate the general laws regulating atmospheric changes, the discovery of which may lead to a knowledge of the coming weather; and to disseminate meteorological information by the publication and circulation of interesting papers."

Complex and vast as this scheme is, including so many obscure problems for solution, we cannot but think favourably of it, and augur success, inasmuch as nothing is proposed to be attempted that may not be accomplished by intelligent, persevering, and united exertion, the qualities for which eminently belong to the Scottish mind.

That branch of it which must be most interesting to the readers of our Review is well introduced by a paper by Dr. R. E. Scoresby Jackson, "On the Importance of the Study of Medical Climatology," in which he discusses the subject in its various bearings, and in a very hopeful manner as to practical results; pointing out how much may rationally be expected from meteorology in alliance with medicine, and how little has yet been accomplished by it, quoting Dr. Brady's complaint to Sydenham, that "no physician hitherto has attentively considered the force and influence of the atmosphere upon human bodies, nor yet has sufficiently ascertained the part it plays in prolonging human life." The author justly adds: "And, with a trifling qualification, Dr. Brady's complaint might with truth be reiterated at the present day."

Let us take a brief glance at the qualification thus adverted to, as showing what climatology has, or is supposed to have, accomplished, restricting the notice to the statements made by the author—would that we could call them facts.

That certain diseases have certain definite habitats, is now generally admitted. Yellow fever, remittent and intermittent fevers, are examples. A definite temperature appears to be required for their production; and yet that temperature may prevail without the appearance of the disease, as witness the non-occurrence of yellow fever in Ceylon and Hindostan, in latitudes the same as those in which the malady is so often a scourge in the West Indies and in South America; thus showing that something more than atmospheric temperature is required, and consequently that so far our etiology of the disease is imperfect. The same remark applies to intermittent and remittent fevers.

The author speaks of plague, dysentery, diarrhœa, as being like epidemic yellow fever under the influence of temperature, as also cholera. Granted; but how certain is it that temperature is not the *vera causa*, only the predisposing cause of these diseases. He quotes Dr. Herbert Barker's opinion as to the prevalency of the foregoing diseases, and of typhus and of catarrh, with the thermometer standing above its mean height; and the contrary in the instances of small-pox, scarlet fever, measles, and some other diseases. We too well know examples of their occurrence with an opposite state of the thermometer, and this within the Tropics and the south of Europe in the hottest weather.

When we reflect on the complicated agencies to which man is exposed, irrespective of the atmosphere, and on the marvellous complicity of action of the atmosphere itself, operating through the medium of heat, light, electricity, magnetism, aqueous vapour, and variable mechanical pressure, to say nothing of its more recondite elements, ozone and miasmata, we cannot be surprised that we are at present merely in the dawn of climatological science. The Scottish Meteorological Society and its Climatological Committee seem to be fully aware of this, and of the caution requisite in making deductions from partial observations. Let such caution be combined with zeal in observing, a certain amount of success, we may be sure, can hardly fail of following, though we are hardly sanguine enough to think with Mr. Glaisher—

> "That were the meteorology of our towns carefully ascertained and collated with that of the metropolis, and both together with that of the country generally, in a short time we should be in a condition to elaborate a clear insight into the meteorological causes of cholera, influenza, and many phases of disease which now burst upon us with the suddenness and devastating power of a divine and wrathful visitation."

Since the above was written, we have received the second number of this journal. Like the first, it contains a large amount of valuable information, and we recommend it strongly to the attention of our readers who are interested in the *science* of climatology. The paper it contains on "Weekly Extreme Temperatures and Amount of Rainfall in Scotland on an Average of Seven Years, from 1857 to 1863 inclusive," by Alexander Buchan, is an excellent and instructive example of meteorological research. The following quotation relative to the ripening of the finer sorts of grain is applicable to many parts of England as well as to Scotland, and may serve as a useful guide to those engaged in agricultural pursuits in our colder upland districts:

"1st. If the highest temperature of the day and the lowest of the night be ascertained every day by thermometers placed *in the shade*, four feet above the ground, in a louvre-boarded box to protect them from radiation; then if the daily mean of the day and night temperatures amount to 56° during the summer months, the temperature is sufficient, but no more, for the ripening of wheat and the finer sorts of barley.

"2nd. If the thermometers be placed on a firm support, four feet above the ground, and be exposed to the sun, to rain, and to the other influences of the weather, and the highest temperature during the day and lowest during the night be thus ascertained; then, if the daily mean of these two temperatures amounts to 58° during the summer months, the temperature is sufficient, but no more, for the ripening of wheat.

"3rd. If a maximum thermometer be kept *in the shade*, four feet above the ground, then if it repeatedly register a temperature of 70° or upwards, in June, July, and August, such weather is quite sufficient for the ripening of wheat."

Art. XXI.—*On the Nature, Pathology, and Treatment of Puerperal Convulsions.* By Richard Hodges, M.D.—*London,* 1864. pp. 96.

The object of the author of this essay appears to have been to impress upon the reader the necessity of employing blood-letting, in some form, in the treatment of puerperal convulsions, and to express his conviction that this remedy is neglected by many practitioners at the present time.

Dr. Hodges commences by stating that recovery took place in every case which he has witnessed, either in his own practice or that of others, where early and sufficient blood-letting was practised, with only one exception; but that where this remedy was omitted, or performed too late, even in cases of apparently little severity, death occurred.

With regard to the exceptional case, he considers that death resulted from rupture of the uterus, and that the treatment was successful as far as concerned the convulsions.

The value of Dr. Hodges' essay would have been much increased if the statistics upon which he founds his views had been more clearly given. Only once or twice in the book, and principally in the concluding chapter, does he allude to 20 cases in the course of his practice, which "he can well and vividly remember from their frightful severity." Of these cases 17 recovered and 3 died, and in one of these venæsection was not performed at all; in another, too late to save the patient; and in the third, the patient was carried off by subsequent peritonitis.

Dr. Hodges finds it impossible to state anything definite as to the quantity of blood to be abstracted in any given case of convulsions to procure these results, and it is equally impossible to estimate merely from the writings of a physician, whether in his daily practice he advises or uses a remedy in excess of the ordinary employment or not. He states that he sometimes takes forty ounces of blood, and at others only eighteen or twenty, and that he freely applies leeches to the temples or behind the ears after such bleedings where the patient's strength does not appear to admit of a further use of the lancet. He advises caution in the employment of the remedy in uræmic convulsions, and in those occurring in weak and delicate women; but he considers such cases by no means constitute the majority.

Most obstetricians look upon venæsection as a remedy of the highest importance in the disease, but guard themselves in such a manner as to make it difficult to discover how often and to what extent they employ it—a point of interest at a time when the use of the lancet in any other form of disease is a rarity.

Dr. Hodges leaves us in less doubt as to his mode of treatment, and assures his readers that it is the success which has followed it which induces him to protest against the tendencies of modern practice. In other points he appears to be pretty much in accord with other authorities; and whilst the portions of his book devoted to the consideration of the nature and pathology of convulsions in general contain a very able exposition of the subject, they are not of a character to call for any special comment.

ART. XXII.—*Commentaires médico-administratifs sur le Service des Aliénés.* Par L. F. E. RENAUDIN, M.D., &c.—*Paris*, 1863. pp. 344.

Medico-administrative Commentaries on the Management of the Insane. By Dr. RENAUDIN.

THIS work is the production of a physician who has been many years occupied in the direction and management of asylums for the insane, and who is further known to the profession as the author of a treatise on insanity, the 'Etudes médico-psychologiques sur l'aliénation mentale.'

In the present work, which might rightly be termed 'A Manual for Asylum Superintendents,' the author unfolds the principles of asylum administration as laid down by French law, and presents a running commentary on the enactments in force regulating the seclusion of persons accounted insane, and their admission into or discharge from asylums. This legislation he critically examines, pointing out its deficiencies and errors, and subsequently devotes much consideration to the internal economy of asylums, analysing their items of expenditure under various heads; and although the French laws regulating the insane and the institutions for their reception differ in many material points from those of this country, yet the greater part of the author's observations will be found applicable and available to the medical officers of British asylums. Indeed, it is interesting and instructive to study this critical examination of the internal economy and government of French asylums, and to become acquainted with those measures for the benefit of the insane which our neighbours across the Channel have learned by observation and experience to be necessary.

Dr. Renaudin strongly contends for unity of administration in an asylum, and therefore for the supreme control of its internal management to be vested in a medical superintendent. This proposition is well established by the author, but he has not devoted sufficient space to the many questions relative to the size of asylums, the distribution of their inmates, and such like. He is opposed to imitations of the so-called "patronal" system of Gheel, preferring asylums of the usual character, with more or fewer detached cottages in connexion with them. He likewise pronounces against the use of single rooms for patients, except as places for temporary seclusion on account of excessive excitement, particularly during the night; and, like English superintendents, has to deplore the delay in sending patients to asylums, in many cases from fallacious notions of economy.

The above observations are probably sufficient to indicate the nature and purpose of M. Renaudin's treatise, and we are glad to be able to recommend it as interesting and of great utility to all those concerned in the administration of public asylums, and also to those who desire to improve our laws relating to insanity and the insane, who may gain some valuable hints from the enactments and usages of our French neighbours in such matters.

Art. XXIII. — *The Ophthalmic Review: a Quarterly Journal of Ophthalmic Surgery and Science.* Edited by J. Zachariah Laurence, of London, and Thomas Windsor, of Manchester. Nos. 1 and 2, for April and July, 1864.—*London.*

We congratulate the profession on the publication of this Review, inasmuch as we believe that such a periodical is needed, and that if it be conducted with ability and widely circulated, it can hardly fail of being extremely useful. Relative to the first condition, we can entertain little doubt, so long as it is conducted by the editors who have originated it. Relative to the second—its circulation—we should be as secure, were we to form an opinion of the extent of the demand for it by the want amongst the great majority of medical practitioners of enlightenment on the subjects of which it specially treats—ophthalmic surgery and ophthalmic science.

That instruction is greatly needed in both, amongst the majority of the members of our profession, must be plain to every one acquainted with country practice; and though, from the nature of our climate, there is less tendency under it to diseases of the eye than in most countries, at least in their acute and inflammatory form, we fear the proportional number of the inhabitants of Great Britain labouring under lost or impaired vision would be corroborative of the opinion we have just expressed.

The plan of this Review, as sketched by its editors in the Introduction to the first number, and as exemplified in that of the second, appears to us excellent. Each number is to contain:

"1. Original Papers and Translations.

"2. Reports of Hospital and other cases.

"3. Reviews and Critical Analyses of Works, Memoirs, Papers, &c., published in Great Britain, Germany, Holland, France, and Italy.

"4. A Periscope or Digest of the principal British and Foreign Ophthalmic Productions. For this purpose an organized system of exchange will be arranged with all the leading ophthalmic periodicals throughout Europe.

"5. Correspondence. This Department will be open to the Profession for the discussion of subjects of interest in Ophthalmic Surgery.

"6. Miscellaneous News and other matters relating to Ophthalmology."

We are glad to read in the concluding paragraph of the Introduction, that the editors have many encouraging promises of aid both from home and abroad. Sure we are that their undertaking is deserving of all encouragement; and it will, we think, be highly creditable to those for whom it is intended, if it receive the support which it requires for its success and for its continuance.

The editors have with much propriety begun that portion of their plan relating to Reviews, by a critical examination of English ophthalmoscopic literature; an able article, well adapted to portray the low state of knowledge we have adverted to, and at the same time to account for it.

Ophthalmic surgery and science, we need hardly remark, have, apart from their speciality, peculiar claims on the profession for attention and careful study; its science, e.g., as a most important and interesting branch of physics, a certain acquaintance with which is essential to a successful practice of its surgery; its surgery, the pathology of diseases of the eye being in many respects instructive in its bearing on general pathology; and the same may be said of the treatment of these diseases, and now more than ever, seeing that we enjoy the aid of the ophthalmoscope: what is thus made clear in one description of lesions becomes illustrative of what is hidden and more or less obscure in the other.

Art. XXIV.—*On some Unsolved Problems in Relation to Public Health.* By William Robert Cornish, Assistant-Surgeon Madras Medical Establishments, and Secretary to the Principal Inspector-General, Medical Department.—No. 1. The Cleansing of Towns.—*Madras*, 1864. pp. 38.

In the last number of our Review, in noticing "Reports on the Nature of the Food of the Inhabitants of the Madras Presidency, and on the Dietaries of the Prisoners in Zillah Jails," we had occasion to bestow our tribute of praise on their compiler. We are glad so soon to have to recur to his exertions in the great and good cause of public health. Mr. Cornish, in his preface, after assigning reasons for engaging in the inquiry which the heading of this article denotes, and stating that he has long entertained a desire to write "a manual of hygiene" suitable for India, founded on the records of the medical departments accumulated during the last eighty or ninety years, proposes, owing to want of leisure to undertake so complete a work, to contribute to it by instalments. The following he promises to enter on *seriatim :*

"1. The cleansing of towns.

"2. The influences of soil and the geological features of a locality upon public health.

"3. Registration of births, deaths, and population statistics.

"4. The influence of rice-cultivation in the production of malaria, with an examination of the evidence upon which the theory of the noxiousness of irrigated lands is based.

"5. On the use and abuse of nervine stimulants.

"6. 'The Social Evil,' and an examination of the evidence for and against the establishment in India of Lock hospitals."

These, for most part, very justly come under the title of "unsolved problems," the solution of which, it must be admitted, is of the first importance, and as much so, with one exception, in this country as in India. We have enumerated them for the purpose of calling the attention of our readers to them, with the hope, and we trust not a vain one, of exciting an interest in them, and their keeping them in mind and doing what they can to aid in their practical solution. The time, we may remark, is favourable; sanitary matters having at last become recognised as a science, and, we rejoice to think, with a just appreciation of its value, not only throughout Europe but also in our Eastern empire, where, owing to high temperature and other peculiarities of climate, the neglect of its principles is most severely and fatally felt. Another hope we must express, that Mr. Cornish may be spared to complete his meditated scheme, which, judging from what we are already indebted to him, if finished, cannot fail of adding materially to our stock of exact knowledge—that knowledge which is power.

Our limited space does not allow us, in the way of analysis, to do justice to this, his first contribution, 'The Cleansing of Towns.' The filthy state of the seats of government in India, of Calcutta, Madras, Bombay, as described, almost exceeds the comprehension of those who have never travelled in the East, and shows in the most striking manner how much inquiry into the causes of the abomination and its remediable means is needed.

The main causes are to be traced to the waste of human excreta—those which, properly collected and used, applied as by Nature intended, prevent exhaustion of soil, when left to ferment in close drains, or allowed to sink into the earth, or to be washed into rivers, become some of the most active causes of disease; in the one instance contaminating the air we breathe by their exhalations, in the other by their impurities poisoning the water we drink.

The prevention of these evils is the great question. Two methods of "conservancy" or "sewerage" have been propounded, and each has had its partizans—the "wet" and the "dry" system—the one acting by the washing away of the excreta by a stream of water, the other by the evaporation of the water they contain, either alone or mixed with earth, thereby preventing their fermentation, and the securing their preservation for use as manures.

We need hardly remark that Mr. Cornish prefers the latter method, and he adduces in its support a mass of evidence which we consider in every way satisfactory and demonstrative of its superiority.

The objections to the "wet" system are many and most serious; and it is sad to think that it is the one in use in this country, and from motives of false delicacy, is likely to be continued in use at a vast cost to the nation—a cost of millions annually—and the no small risk of injury to health by the contamination of our streams and rivers.

The author proposes a plan by which, for a moderate outlay, and eventually a probable profit, the excreta, fæcal and urinary, might be removed and used as manure, founded on the well-known properties of earth to absorb the one and deodorize the other. For the details, and for a sketch of the buildings required, we must refer to his pamphlet. That it is practicable and efficacious, appears to be proved by trial of a like plan in this country. We advert to what has been done in a limited way in certain public institutions and cottages, with, as reported, a decided success. The workhouse school of Bradford-upon-Avon, containing fifty-five children, is an instance. There, it is stated in the appendix, "the latrine has been reduced from a condition of 'noxious pungency' to a state of inoffensiveness by the simple method of keeping a box of dry earth with a scoop in the place, and requiring the children to throw in a scoopful on each occasion of use." This information, with other instructive particulars on the subject, is from a paper by the Rev. H. Moule, communicated to the Society of Arts in May, 1863, in which he strongly and admirably advocates the dry, or as he designates it, "the system of earth sewage," in opposition to the wet or flushing plan. And we are glad to learn that the method is so far advanced as to warrant the hope that it may finally supersede the wasteful usage of water-closets,—"patent earth-closets," self-acting, having already been invented, by the use of which comfort as to the exclusion of bad smells is combined with economy, so that were they in general use, the saving of millions now spent in the purchase of guano, to check the exhaustion of our fertile soils, might be effected—an exhaustion certain, sooner or later, if the phosphates and other elements contained in our excreta are not preserved.

The advantages of the "earth sewage," as propounded by Mr. Moule, are recapitulated by Mr. Cornish as follows:

"1. Costly public works not required.

"2. No waste of matters which have been taken from the soil.

"3. Cleanliness, and absence of offensive smells.

"4. Prevention of those diseases which depend upon poisonous gases evolved in the fermentation of human deposits."

5. And, we would add, the prevention of our rivers and streams being fouled and poisoned.

One of the advantages of England's widely-extended empire, and, as we think, not undeserving of the attention of Mr. Goldwin Smith, is the opportunities and facilities which it affords for solving problems such as those to which Mr. Cornish is directing inquiry. Water sewage, which in England can be tolerated, where the average temperature for most parts of the year is little above 50°, becomes almost intolerable and especially dangerous where, as in India, the average temperature, the greater portion of the year, is above 70°, water even at 60° promoting putrefactive decomposition. Moreover, let it not be forgotten how much the national character for energy and intelligence is heightened by the pursuits and duties in which so many of our countrymen are engaged in our vast foreign possessions.

ART. XXV.—1. *On the Freezing of the Egg of the Common Fowl.* By JOHN DAVY, M.D., F.R.S. From the Transactions of the Royal Society of Edinburgh.[1]

2. *Some Observations on the Eggs of Birds.* By the same.[2]

IT is well known to physiologists that John Hunter was led by experiments upon the freezing of the barn-door fowl to suppose that the fresh egg resisted heat, cold, and putrefaction by virtue of a vital principle, or "living" principle. In 1850 Mr. Paget experimented on the same subject, but determined that it was not through any such vital principle that eggs resisted the influence of cold, but "that the property which enables fresh albumen to descend below 32° Fahr. without freezing is its peculiar tenacity or viscidity, by means of which the water combined with it is held so steadily that the agitation favourable or even necessary to the freezing at or near 32° cannot take place." Dr. Davy offers us further remarks on this most interesting subject, based upon recent experiments with fresh-laid and old eggs; but his experiments differed from those of Hunter and Paget in a material way, for whereas their experiments were made by subjecting eggs to a process of rapid cooling by means of refrigerating mixtures, Dr. Davy cooled his eggs merely by exposure to the night air, and thus the process was very slow. From them he concludes that there is no well-marked difference "as to freezing between the newly-laid egg and the egg which has been kept many months, nor any well-marked difference as to their rise or fall of temperature;" and also that (as Mr. Paget had previously concluded) the egg is *not* protected under these experimental trials by any "vital principle."

Dr. Davy has also made a series of experiments having the same

[1] Vol. xxiii. Part 3. [2] Read at the British Association Meeting, Newcastle, 1863.

tendency as the above-mentioned, on the freezing of the different parts of the egg by ether and a freezing mixture in a thin glass tube. He considers that the tardiness with which, at a low temperature, the egg becomes frozen, is not only in part due, as Mr. Paget thinks, to the viscidity of the albumen resulting from the enveloping filamentous tissue, but is also owing to the saline character of its several parts. Dr. Davy appears somewhat doubtful whether the resistance of the egg to freezing pertains to that of the common fowl to such a degree as Mr. Paget supposes; and again, whether the freezing of the egg is compatible with *any after*-development. He leaves unanswered the question, whether the germ can exist, retaining life, without vital action of any kind, even at a temperature below the freezing point?

Our market-wives will, no doubt, thank the author for a practical and valuable hint; for he found that in comparing the condition of the newly-laid egg with that of the egg which had been a year in lime-water, the latter was found to contain a quantity of air (which proved not to be carbonic acid or nitrogen, but common atmospheric air). It is owing to this circumstance that lime-eggs, when boiled, will often crack, frequently with explosion, when placed in boiling water.

In the paper communicated to the Newcastle meeting, alluded to at the head of this notice, Dr. Davy, among other interesting facts, shows that the thickness of the shells of birds' eggs is very various, and that it appears to bear some relation to the weight of the incubating bird, and to the time of incubation and hatching. Generally, the smaller the bird, and the shorter the period of fœtal development, the thinner is the incrustation (the shell), the elasticity of the shell increasing with its diminution of size. Dr. Davy describes an air-cell as existing in the egg of all birds, formed by the separation of the two layers of their internal lining membrane (at the end of the egg which is generally the largest and first presented in the act of being laid). This air is, no doubt, for the aëration of the embryo and fœtus, and differs but little from atmospheric air. As respects the various colours of the shells of eggs, Dr. Davy is led to attribute them not to the presence of mineral matter, but to that of organic or animal colouring matter, "and that, in part at least, connected with molecular arrangement analogous to what is witnessed in flowers." The author details experiments upon the proportional weight of the albumen and yolk, the density of the two, and the effects of heat, and its degree in producing the coagulation of the albumen in the eggs of various birds.

ART. XXVI.—*On the Anomalies of Accommodation and Refraction of the Eye, with a preliminary Essay on Physiological Dioptrics.* By F. C. DONDERS. Translated from the Author's Manuscript by W. D. MOORE.—*London,* The New Sydenham Society, 1864. pp. xviii. and 635.

PROFESSOR DONDERS has long been known as an able physiologist and ophthalmologist; his repute in the latter respect has been principally acquired by a series of papers of physiological and pathological interest on the accommodation and refraction of the eye. In these he turned to practical purpose some important data which had been already determined by Young and others, and gave the results of his own reflection and experience derived from an immense number of cases which he had carefully observed and analysed. We have already given an account of some of these researches in a critical review on the optical relations of the eye.[1] The present work is not, however, a mere translation of these papers; in every part they have received numerous amendments and additions, so that they really represent a second edition, brought down to the present day. The medical man may refer to this work with confidence, for he will here find all that is known of the origin, symptoms, course, and treatment of each special affection, explained in the clearest and most satisfactory manner.

Of all the ills that human flesh is heir to, none are more frequent than those to which these pages are devoted: often commencing in childhood, a constant source of trouble and anxiety during adult life, and the inevitable lot of old age, they deserve for this reason alone more attention than they have generally received. If we remember, besides, that patients so afflicted have hitherto been almost entirely neglected by the medical man, and that thus they have been able to avail themselves of only the dubious aid of the mechanical optician; that by efficient treatment the progress of some of these affections can be arrested, and that the evil consequences which occasionally ensue, such as squint and asthenopia, can be prevented in others, it cannot be denied that the ophthalmic surgeon should be fully, and the general practitioner to some extent, acquainted with their characteristic symptoms, so that they may be early recognised, and appropriate means employed. It must be admitted, even with regard to spectacles, that it is only the medical man, fully conversant with the methods of estimating the refractive condition, the muscular power, the acuteness of vision, and the ophthalmoscopic phenomena, that can rationally advise the glasses best adapted for use.

The importance of this work would justify us in devoting considerable space to it; we prefer, however, recommending the reader to study it for himself, for assuredly he will be well repaid, and we imagine that any attempt at analysis is unnecessary, owing to the wide diffusion and the easy terms on which the volume is obtainable. We shall, therefore, only remark that Professor Donders, by the employment of every means of accurate investigation, by exact definitions, by clinical experience, and by the comparison of his own researches with those of other physicians, has succeeded in almost completely clearing up a class of diseases previously in extreme confusion. Were we to attempt to characterise the present treatise in a few words, we should say that it well deserves the epithet "exhaustive:" it is equally scientific and practical—full, yet not diffuse, clearly and pleasingly written, and

[1] British and Foreign Medico-Chirurgical Review, January, 1862.

freely illustrated by cases and woodcuts. This is undeniably one of the most able and valuable works published for many years. We must not neglect to add that the translator appears to have most ably and satisfactorily performed his very tedious and difficult task.

Most heartily do we thank the author for the great benefit he has bestowed on the medical profession, and the New Sydenham Society for the impulse it has given by this important publication to British ophthalmology.

Art. XXVII.—1. *The Races of the Old World: a Manual of Ethnology.* By Charles L. Brace, Author of 'Home Life in Germany,' 'Norse Folk,' &c.—*London*, 1863.

2. *Introduction to Anthropology.* By Dr. Theodor Waitz, Professor of Philosophy in the University of Marburg, Honorary Fellow of the Anthropological and Ethnological Societies of London. Edited, with numerous additions by the Author, from the first volume of 'Anthropologie des Naturvolker.' By Frederick Collingwood, F.R.S.L., F.G.S., F.A.S.L., Honorary Secretary of the Anthropological Society of London.—*London*, 1863. pp. 404.

3. *Five Years' Residence in the West Indies.* By Charles William Day, Esq., Author of 'Hints on Etiquette.' In two volumes.—*London*, 1852.

Mr. Brace's 'Manual of Ethnology' and Dr. Waitz's 'Introduction to Anthropology,' claim a notice from us on purely scientific grounds. It is not for reasons of quite the same kind that we propose herewith to draw the attention of our readers to Mr. Day's 'West Indies.' The author of 'Hints on Etiquette' would decline to be classed with men of science as indignantly as Horace Walpole protested against being mistaken for D'Alembert. Still, if we may judge from what we hear and see all around us, his work contains just the sort of Ethnology or Anthropology—call it which you will—which is likely to be acceptable just now in a country where the principles of Wilberforce, Buxton, and Brougham have less weight than they formerly had. We will begin with the two works placed first at the head of this article; and in our short notice of them we will not attempt to define exactly the limits of the provinces which usage has, or rather has not, assigned to the Ethnologist, Ethnographer, and Anthropologist respectively, but we will state briefly what are the great questions treated of in books bearing those titles, and what the lines of evidence which must be followed in investigating them; and finally, in what fashion each of the two works under review performs the task it undertakes.

It is agreed upon all hands that there are differences between one race and another of mankind; that the black man differs from the white, and both again from the red man. Further than this, it is not denied that within each of these great divisions there are smaller subdivisions, varying in their several affinities and relationships. Here agreement ends and discussion begins. Firstly, questions as to the degrees of relationship between these smaller subdivisions, between the various *nations* of the earth, have called volumes innumerable into being, some of them possessing permanent interest, some of no value whatever. For the solution of these questions the assistance of anatomist and physiologist, of physician and traveller, of historian, antiquarian, and psychologist, has been invoked and obtained. Secondly, it being allowed that these varieties exist, questions naturally though somewhat tardily arose as to the length of time they had existed: Archbishop Usher of the seventeenth has been fiercely attacked by Egyptologists and others than Egyptologists of the nineteenth century; and the public has of late become familiarized both by eye and ear to the subject, "The Antiquity of Man." The same scientific witnesses give evidence in this who gave it in the former investigation.

The third great question is, Do those different families and tribes of mankind differ from each other in the same way that confessedly different species of the lower animals differ from each other, or do they differ only as confessedly different *varieties* of such animals differ? Upon this subject we must listen to the zoologist. Without some practical acquaintance with some branch or other of his vast science, it is difficult to understand how any one can approach, not to say judge of, this question. Unless a man is something of what is called in scorn a "species-monger," it is simply an impertinence in him to meddle with this discussion. If he does attempt it, all his arguments may at once be reduced to the following skeleton form—"Such and such a division of the human family differs or does not differ from such and such another, as much as such and such a brute species, of which I, not being a zoologist, know nothing, differs from such and such another, of which I know less." His arguments are a sum in Proportion, with two of the four terms unknown quantities, and running thus—$a : b = x : y$. Of such arithmetic we have lately met with many instances. Ethnology and Anthropology, indeed, have more than a fair share of such argumentations; and we have recently had a pamphlet published against the Aryan or Indo-Germanic theory by a person who, describing himself as a "non-Sanskritist," tells us thus on his very title-page, that one of the terms of comparison which he has to employ is to him an unknown quantity. The self-styled "physical" writers to whom we allude are more cautious and less explicit than the linguistic. Fortunately we have examples to mention of a different kind. Von Baer, Vogt, the recently deceased and much lamented Rudolph Wagner, and Mr. Wallace, are instances of men who, having mastered by long labour in various fields of biological inquiry what the term "species" really means, have, in the full strength of their ripened and practised minds, addressed themselves to the question, "Is the human family made up of one or of many such groups as we have been working at and out in so many other realms of animal life?"

The subjects, then, of primary moment, of which Ethnographers, Ethnologists, and Anthropologists treat, are in number three—to wit, the relative affinities, the antiquity, and the specific or non-specific difference of the several divisions of the great human family.

It is to the first of these great subjects that Mr. Brace's work is mainly, though not exclusively, devoted. His familiarity with all or well nigh all the authorities on the races of the Old World down to writers as young and, as we rejoice to think, as likely to live to be as old as Lord Strangford and Mr. Max Müller, and the easy style of his practised pen—if that be not a tautology—make it no less a pleasure than a profit to follow him through what is in many another such work as uninteresting as the muster-roll of Xerxes or the latter half of the second book of the 'Iliad.' In Mr. Brace's three hundred and thirteen ethnographical pages there is, as his title-page informs us, no mention of the American races; but the author will, we hope, redeem the promise half-made in his preface, by giving us in a second, and that a similarly executed volume, the ethnology of his native continent. His last two chapters are devoted to our second and third great questions—the Antiquity, namely, and the Unity of our species; and we can speak of these concluding eighty-seven pages in terms of almost unqualified praise. They contain by far the best *résumé* of the original works on these subjects which has yet appeared. His application of Mr. Darwin's views to the settlement of the latter of these momentous questions is most ingeniously conceived and most dexterously carried out. We commend it to the attention of his compatriot Ethnologists, from whose conclusions Mr. Brace differs as widely as the dignity and polish of his language differs from the vulgarity and flippancy of that in which 'The Types of Mankind' and 'The Indigenous Races of the Earth' of Messrs. Nott and Gliddon are so appropriately composed. Indeed, the pleasure we have had in reading Mr. Brace's 'Manual' is nearly equalled by the surprise we feel in thinking it should have come from the same country as the works we have just cited:

> "Via prima salutis
> Quod minimè retis, Graiâ pandetur ab urbe."

As a minor merit we will notice the plan, familiar to our readers from its employment in Professor Owen's and Dr. Kirke's works, of numeral references in the text to lists of authorities at the end of the work. By this simple plan the process of studying is greatly expedited and facilitated, and distraction or abstraction put at the option of the reader.

On Dr. Waitz's 'Anthropology,' as translated into English, we cannot bestow quite the same unqualified commendation and recommendation. Firstly, it is a translation; and the very best of translations, such as we believe Mr. Collingwood's may be, can never have the precision or, to change the metaphor, the vividness or the freshness of an original composition. A herbarium is not the "greenwood;" Alexis Soyer himself could not have endowed a *rechauffé* with osmazome. Secondly, though a larger book than Mr. Brace's, it does not go into the ethnographical details which his does. And thirdly, the spirit of exhaustiveness, which is a purely German spirit, seems to have taken such complete and entire possession of Dr. Waitz as to have cast out a spirit also usually supposed to have German affinities—to wit, the spirit of critical discrimination. It is painful to think of the clouds of dust which the learned professor must have raised by taking down volumes long left undisturbed in the venerable repose of the Marburg libraries; but it is even more painful to think into what company some of the most honoured authors have been brought by his omnivorous appetite for references. Dante frowned not more austerely in the flesh—nay, he frowned not more austerely this very year on the Royal Academy's walls—at the company which misfortune has associated him with, than the better of Dr. Waitz's authorities would frown at the strange company they are brought to keep in his foot-notes. For instance, we observe by the index—the words in which, by the way, are not always in alphabetical order—that whilst Vogt is referred to four times, and Rudolph Wagner three times, and Mr. Wallace and Von Baer not at all, Mr. Day is quoted upon no less than five occasions. Now we knew that Mr. Walpole took in grave earnest Lord Derby's jesting proposal to give the militiamen votes, and we were told that arrangements were made at the Home Office for the expeditious measurement of them for the franchise; and we knew also, what is perhaps more to the present purpose, that Von Siebold had thought it necessary gravely to deny that an echinoderm could wink with an eye of derision, as the ever-genial Edward Forbes had laughingly described it as doing; but that Charles William Day, Esq., author of 'Hints on Etiquette,' should be quoted by a scientific man like Dr. Waitz, has surprised us more even than, as we fear, it will have displeased him. Mr. Day, it is true, is quick in detecting and fearless in exposing the *mésalliances* of the West Indian settlers, and the evolution of many of them from the larva stage of Scotch tradesman or governess into male and female aristocrat;[1] and his views as to the negro's capabilities and claims on humanity are much the same as those propounded in a certain self-styled scientific pamphlet to which we shall again refer. Still, how Dr. Waitz, who most justly characterizes Messrs. Nott and Gliddon's utterances as to the negro as "shameless exaggerations,"[2] and who speaks of finding them "speaking in a rational way" as being a rarity (see p. 225), should have come to quote Mr. Day, is to us incomprehensible. But out of respect for Dr. Waitz we will, in blind faith, follow his example, and in our turn, too, make quotations from Mr. Day's valuable work. Our quotations will enable our readers to form an estimate of Mr. Day's profundity, firstly, in zoological and biological matters, and secondly, in ethnological and anthropological. Unhappily we can give but samples, and those relating to matters under our first head shall be taken from a single page—viz., p. 122, vol. i. The italics are ours. Mr. Day meets with an animal strange

[1] See vol. i. pp. 31, 63, 81, 223, and, indeed, both volumes *passim*.
[2] See p. 92, Introduction to Anthropology.

and new to him: "I put him," he says, "house and all, on a mahogany sideboard, and found that in a few minutes he had spun a silken cord, and apparently come to an anchor." Unfortunately for science, the animal disappears; but Mr. Day tells us, "It was a CHRYSOLITE, called by the children here a Ham, producing a large butterfly; and that is all I could learn about it." From this it would appear that Mr. Day's knowlege of the facts of insect metamorphosis was in the same condition as that in which the Oxford and Cambridge mission found the knowledge of the Zambesi negroes to be.

We pass over a mysterious narrative of "a large milk-white hassock or stool" carried about by a "mammoth arachne," commending it to the attention of our great authority on spiders, Mr. Blackwall, who will find a fuller explanation of the matter elsewhere in this work. Leaving entomology, and arachnids, Mr. Day proceeds in the same page to treat of vertebrata: "The *agiouti* is in colour and form like an enormous rat. It is strictly *herbaceous*, and has many habits in common with the *marmotte* tribe." The next quotation is anatomical, and will bring us within a line of the bottom of the page: "Fowls are here invariably execrable, with yellow skins as coarse as a nutmeg grater, and *sinewy purple muscles* beneath; there is *no meat* on the breast." Muscles and meat, we submit, are identical, but we must proceed to Anthropology: "Horses, dogs, monkeys, and parrots are capable of instruction, and why not teach negroes?" (Vol. ii. p. 64.) "Negroes, French or English, are the same, and only one step above the monkey." (Vol. ii. p. 162.) "Negroes are idle, mischievous, stupid, and gluttonous beyond the power of imagination to conceive." (*Ibid.*) "The same elongation of cranium, *which I noticed in the Turks at Constantinople*, is also the characteristic of the negroes." (p. 165.) The following quotations will not be so gratifying to the present representatives of Clarkson in this country as the preceding. We believe, however, that they are to the full as true, though no truer:

"Our countrymen, whether English or Scotch, being uneducated and vulgar . . . . . The British Trinidadians are cold, selfish, and full of ridiculous pretension, without qualifications of any sort to justify it. There are very few Irish in Trinidad, and those very low ones. There is an utter want of principle amongst all classes, and great peculation is known to be going on in many of the official departments, but no one likes to interfere." (Vol. i. p. 208.)

"There seems to be no villany, no rascality, which the white inhabitants do not practise on each other, and on the others whom they chance to meet. This is particularly the case with the official people placed in authority and by authority over negroes and their fellow-whites as their moral guides. They are swindlers, drunkards, and debauchees." (Vol. ii. p. 311.)

We suppose that but few works in our language can be found so full of scurrility and blunder.

PART THIRD.

Original Communications.

Art. I.

On Construction and Degeneration. (*With especial reference to the Lungs.*) By T. C. Allbutt, B.A., M.B. Cantab., Physician to the Leeds Infirmary.

Essay No. II.

In April last I had the honour of laying before the readers of this Review certain opinions on the states of the animal body in health and disease. I pointed out the growing belief that the higher ranges of vital action, correlative with certain visible developments of structure, are dependent upon the building up of more and more complex structural units; that what we call the manifestations of force in healthy function result directly from the stability of such units; that immaturity depends upon incomplete molecular construction, and disease upon the arrest or failure of it; that the processes of such failure or degeneration exhibit those of growth in an inverse series, so that resulting phenomena can only be called healthy and morbid in a special and relative sense; lastly, that the elaboration of such structural complexity depends upon the influence of neighbouring matter, which has already attained the required degree of complexity, and by resolution is converting tension into energy.

If the organs, therefore, which are set apart in the higher animals for the exercise of such energy—i.e., the "constructive glands"—fail in previous attainment of the required tension, we must find as consequences imperfect elaboration of structural elements, failing structure, and failing function. In many of those affections which are called "blood diseases" we see a dynamic change throughout the whole system. With a lessened energy of molecular construction we get diminished tension, and the changed state "ἐν δυνάμει" becomes manifest "ἐν ἐνεργείᾳ."[1] Structural advance is therefore proportionably slackened, and general equilibrium also disturbed, as is seen in quickened circulation and inordinate action of organs. Thus arise many forms of disease, varying in individuals as the external conditions, and as the paths of least resistance in the peculiar structure of each. For instance, a common result is fibrous degeneration, showing itself as rheumatism

[1] In using Aristotle's words for the sake of convenience of expression, I should perhaps guard against any real distinction between the two terms as in his sense.

and fibræmia in systemic weakness, or as fibrous tumours in local weakness. Either through general or local want of tension in molecular combination, the special structural character cannot be impressed on nutritive material, and the parts degenerate from the special towards the general—that is, from the differentiated structure of a particular organ to the simpler fibrous mode common to all parts of the body. What is lost in intensity is, for the most part, gained in extensity, and the loss in quality is gained in quantity.

If the failure in tension be still greater, we descend through transitional forms from rheumatism to pyæmia, and from fibrous to cellular tumours. In gonorrhœa, for example, the contact of matter in the state of cellular degeneration tends to propagate a similar descent in contiguous matter in the blood-vessels and neighbouring tissues. A greater demand is made upon the constructive glands in the vicinity, and their functions and structure thereby modified or disturbed.[1] If the upward processes be active, the degenerative influence produces little effect, and molecular tension is not overcome to any perceptible extent, or to an extent only perceptible in modified function. A brick taken out of a well-compacted wall is lost with indifference; if, however, the wall be less coherent, local dislocations will ensue upon the removal. If, again, the parts hang loosely together, shock or demolition will result throughout its structure. Thus, in still weaker states of the body, that diminished tension of parts caused by the influence of local purulent declension may be propagated indefinitely throughout its constructions. A general tendency to failure will, in such a case, show itself in the rigors of shaken nervo-muscular equilibrium, in the rapid pulse of shaken nutritive equilibrium, and in structural changes passing through half-rheumatic and half-pyæmic phases, down to the dissolution of all the higher states of molecular tension, in the liquid blood and cellular degradation of rapid pyæmia. The infinite multiplication of the lower forms which replace the higher is exactly parallel to that phenomenon as observed in the epidemic degenerations of animal and vegetable forms.[2]

How in local failure of structural tension, with diminution of resulting energy, the more special structures degenerate into the less special, sinking cadence by cadence through the infinite series of fibrous, fibro-cellular, amorpho-cellular, and amorphous degenerations, has been so ably shown by Dr. Wilks, that I need but allude to his labours.

If the reason of disease be such as I have endeavoured to set forth, should we not have bestirred ourselves to clear out of our minds and

[1] This secondary disease of the glands in all parts of the body is a study of much interest. I hope during the next year or two to investigate it more thoroughly, "ne et oleum et opera philosophiæ nostræ perierit."

[2] Whether the so-called "parasitic" forms which accompany the degradation of superior forms, are modifications of pre-existing structural elements, as are pus-cells, or whether the originating germs be introduced from without, is of secondary importance in this inquiry. In either case there must be a parallelism of structural processes between the parasites and the decaying constructions from which they take their existence. Dermatologists are agreed that whatever be the source of the originating germs of favus and like forms, they can luxuriate only in failing constitutions, and are to be extirpated by constitutional melioration, just as are the forms of structural degradation in the lung. Thus the essential relation between the development of masses of favus and of masses of tubercle is one of likeness.

out of our books all those forms of expression which connote the foreign nature of morbid growths? Still more, should we not be very wary in allowing the use of such expressions as "deposits from the blood," and the like? In the absence of proof to the contrary, we are bound to regard all morbid products as modifications of local construction, local degeneration being the starting-point.

A cancerous tumour of the pylorus is no more a deposit from the blood than is the pylorus itself. In one sense both, in another sense neither, are deposits therefrom. Neither could arise without nutritive material, and, on the other hand, neither could arise except as implicated in the development of neighbouring parts. Cancer is formed in an individual as any other tissue is formed, all being alike parts of a certain scheme of evolution, and dependent on the blood only for material of nutriment. Perhaps few regard cancer from any other point of view; but if language is to be believed, still fewer look upon "tubercle" as of similar generation. The development of the body, indeed, depends on circumstance as well as on original nisus; nevertheless, some parts of certain organisms tend, in spite of all circumstance, to follow an order of structural arrangement which we call "tubercular," rather than another order, which we call normal. Both are equally natural, but the latter is the more useful. The "blood" no more deposits the one than it deposits the other. Nevertheless, many able writers persist, from habit or conviction, in speaking of the deposition of tubercle as dependent upon the blood, in some special or structural sense. Their words convey an idea of implantation from without, and they talk of finding tubercles as they would talk of finding truffles.

It seems, therefore, worth while to consider more particularly the reason of tubercular generation, taking its generation in the lung as an instance of its modes. Phthisis pulmonalis is a chronic pulmonary disease, as opposed to acute pneumonia; and nearly all chronic thoracic diseases have relations with phthisis. We could not possibly have the two opposite modes of disease—the acute and the degenerative—better contrasted, the former due to external hindrance or violence, the latter to internal weakness. I have preferred the word "degenerative" before the word "chronic," as I consider the distinction of time to be always accidental, and often fallacious. Degenerative disease, the so-called "chronic," is not a mere extenuation of the acute. The one may end in the other; the one may so pass into the other, or be so engaged with it, that demonstration alone cannot show their difference at any given moment; they are, nevertheless, always separable in reason. In the lung, as elsewhere, the acute disease is that which comes of causes from without, such as intropulsions by cold, mechanical injuries, or the sudden action of some poisons; the chronic (or degenerative) disease shows failure, on the other hand, from within; and according to the degree of internal weakness it presents many varieties of degeneration, from a slow development of inferior structural products to swift disorganization. Between acute pneumonia and ulcerative pneumonia, or phthisis, there lies a series of semi-acute, semi-degenerative pneumonias varying in character as the ratio of the external to the internal causes.

In slow phthisis small portions of the lung structure slip imperceptibly into lower stages of organization, giving rise by loss of quality to increase of quantity or mass. Such masses are no longer fibro-cellular, but more or less cellular, passing into the amorphous, and hardening as their moisture evaporates from the lung. The establishment of small points of lesion is followed by a more or less efficient reparative process, which often excites inflammation at corresponding points of the pleura and other neighbouring parts. The permanence of these masses or tubercles, like their origin, depends primarily on the stability of the circumjacent tissue, and they are themselves accidental manifestations. The etiology of phthisis pulmonalis, therefore, lies not in the tubercle, but in the properties of the lung-tissue and in the processes of its construction and degeneration.

If I may again refer to my former use of the words Construction and Degeneration, it will be seen that the former word signifies the elevation of organic matter through higher degrees of intensity and complexity, by the influence of neighbouring matter already possessed of such properties; and that by degeneration I mean the resolution of such neighbouring matter into more extense and simple forms, with conversion of tension into energy.

Let us now conceive an action of some depressing agent upon the whole body. In place of the highest degree of tension we shall get a proportionate relaxation throughout the tissues. The tension between the tissues and the circulating fluids will yield, and will show itself in quickened pulse, defective cell generation, weak and flabby tissues, and local changes in the relation of these to the blood, as seen in wandering congestions, perspirations, fluxes, and the like. Such symptoms are common in states of debility. These results become more manifest in more advanced states of depression. There is imperfect cell-generation, as seen in unhealthy mucous membrane on the tongue, stomach, and bowels; also in the loss of subcutaneous tissue, falling of hair, clubbing of nails, and like signs. As the depressing cause continues, failure of function and structure must penetrate deeper, until some one or more of the vital organs are affected, and death sooner or later ensue.

Such a simple depressing influence ending in death, we see experimentally produced in the case of negroes, monkeys, dromedaries, &c., when transferred from a warm to a colder or less pure atmosphere. Such a form of decay and death, again, results from the action of an exhausting disease like diabetes. It becomes, then, a most interesting question with such conditions to determine which internal organ or organs will first give way. Given a body with no special tendency to disease, and a due molecular tension throughout, which internal organ or organs will first give way on the lessening of such tension by any simple depressing cause?

The remarkable constancy with which degenerative pulmonary disease shows itself after a more or less prolonged action of depressing causes, would lead us to the conclusion that phthisis pulmonalis owed its appearance to no specific vitiation. This form of disease seems rather to be the most direct route taken by general structural failure. In such states, we should avoid speaking of the supervention of phthisis.

as the arrival of a new and distinct disease, and should rather speak of reaching phthisis as a particular stage on the way of dissolution. No doubt the lungs may, in certain individuals, be congenitally weak, and so liable, as any organ may happen to be liable, to degeneration, in spite of all circumstances. But it would also seem that in the healthy body, where all organs are of normal validity, the lungs are relatively the weakest in structure. When, therefore, depressing causes, original or accidental, acting upon such a body as a whole, become stronger than is compatible with completion of construction, the part where structure will first give way is probably somewhere in the lung. Clearly, when conditions are adverse, some part of the body must go first, unless all parts are of equal strength, which we believe not to be the case. Disease of such a part would then be common, and we should expect to see a previously healthy body put under exhausting conditions finding its way to disintegration along the line of the failure of such part.

Now no structure in adult man seems more likely to present such weakness than the lung. We see therein a structure at once exceedingly delicate and exceedingly elaborate. Other parts may vie with the pulmonary structures in delicacy, but I think not in delicacy and complexity together. The lung has to strive, not only against the evanescence of delicate elements, but also against the demands of an elaborate organization of such elements. The degeneration of cells in the stomach is not so serious a matter as it would be did this necessity there also exist of reconstructing them after an intricate pattern. Hence the peculiar disadvantage at which the pulmonary structures stand; and hence their early liability to irreparable injury under the action of causes affecting the whole body alike. Of all the bodily organs, the lungs seem in the adult to stand the nearest to the brink of destruction.[1] Seeing, then, that the causes of phthisis are as many as exercise a common influence of depression, we need not look beyond for any specific vitiation in the blood or elsewhere. "Frustra fit per plura, quod fieri potest per pauciora."

I presume, therefore, that as material is abstracted, say in diabetes, or as tension is diminished, say by change of climate, constitutional feebleness, or other causes, so all parts of the body become progressively degenerate, such degeneration being less or more important as it invades less and more important structures; and that such degeneration early becomes breach of continuity in the delicate and complex lung-structure, the activity of progressive ulceration being in an inverse ratio to the reparative power. Such causes, when they act powerfully, will bring on rapid destruction, as in the reported cases of starvation pro-

[1] With advancing years the relative activity of organs among themselves varies, as the functions themselves are modified. Thus in early life it is not the pulmonary structure, but rather that of the constructive glands which seems to go first. That scrofula, which is simply a feebleness of the constructive powers, should commence in the constructive glands at a time when their delicacy of structure and their vascularity is greatest, and the demand upon them the strongest, is probable enough. With advancing years the conditions are changed, the glands are less active, and accordingly less liable to disease. The atrophy of all these glands in old persons is a regular observation in the deadhouse. To this subject I hope to return.

ducing pulmonary gangrene; if they act with less energy, we shall only find a gradual accumulation of larger masses of an inferior product, in place of the less bulky but more highly organized lung-tissue.[1]

In like manner we shall find, according to the activity of the causes, degeneration more or less advanced in other organs, such as the heart, the liver, the stomach, or the intestines. All these degenerations belong to that pathological unity, the phthisical process, which is the process of simple structural disintegration of the human body. Of this process, ulceration of the lung is an early and serious manifestation.

Let us proceed a step beyond this point. The line of thought which leads to discovery of the relations which pulmonary degeneration bears to that of other organs, will lead us on to discovery of the relations which the degeneration of certain parts within the lung bears to that of the other parts. That rapid disintegration or gangrene of the lung which results from depressing causes of severe and rapid action, as it is quickly developed, so it owes its initial position in the lung more to the accidents of accession (such as slight passing congestions and the like) than do those slower degenerative processes which, being independent upon passing accident, obey some more uniform law. It is notorious that some uniform condition exists which determines degenerative disease towards the apexes of the lungs. This condition, however, remains undiscovered. I have stated my belief that degenerative disease is early manifested in the lungs because of their more delicate and complex structure. Can we now extend this reasoning to the parts of the lung itself? Let us take the lung in a simple state of its evolution; let us take, for example, the lung of a serpent. In it we find the vascularity and complexity towards the apex, while the base is a mere membranous bag. If we take the lung of a tortoise, we find a like relative distribution of the more and of the less delicate and complex tissues, though the fuller development of the whole organ makes the difference less obvious. As we pursue our investigations upwards we find this distinction less and less manifest as the progressive evolution of pulmonary structure advances; so that in mammalia the distinction between apex and base is no longer evident. But it can scarcely be supposed that a law holding good for so many stages of the ascent is suspended for the remainder; and it is much to be wished that an accomplished microscopist would find leisure to investigate this matter. The result of my own slight observations, and of my inquiries among my friends, carries me only to this point—viz., that it seems true that the lung-structure in man becomes more delicate as it approaches the trachea.[2] All the analogy, indeed, afforded by the exquisite and continuous gradation of form and colour in nature would prepare us to expect gradation of structure in the lung. This much is certain—that whatever may be true of the lung as a whole, the structure of the lobules is undoubtedly such as I have suggested. The structure of each lobule increases in coarseness

[1] I may perhaps say here that I avoid in general any use of that metaphorical and deluding term "inflammation."

[2] In my microscopical researches I have had the advantage of friendly aid from the Rev. W. T. Kingsley, of Kilvington.

from about the air-tube to the periphery; the extreme difference in size of the cells being in about the ratio of ten to one. Now when the degenerative tendency is so intense as to invade large parts of the lung from the beginning, as in pyæmia or large superficial burns, there we find disease starting in the finer portions of the lobules and progressing towards the coarser. In such pneumonias we accordingly find many foci of disease separated by more healthy tissue; and such states we call lobular pneumonias. Such pneumonias are, of course, degenerative, allied to phthisis, and opposed to the acute pneumonia.

In acute pneumonia, we find large portions of the lung uniformly injured by the pressure of congestion, which acts thus uniformly in accordance with the law of gravitation. This disease, therefore, takes the bases of the lung, which generally lie at greater disadvantage; or under certain circumstances it attacks the backs of the lungs when the congestion happens so to fall. Even at the bases the lung-structure is too delicate to bear a sudden intropulsion, which might have left other organs unharmed.

We seem, then, to have reached this point. Of all structures in the body the lungs are most liable to lesion, as being the most delicate and complex. Such lesion may arise by injury from without, giving rise to acute pneumonias, or by weakness from within, giving rise to degenerative pneumonias. The type of the former is common acute pneumonia of the bases; the type of the latter is an ulcerative pneumonia of the apexes, known as phthisis pulmonalis. Between these two extreme types lies a series of pneumonias, partaking more of the acute or more of the degenerative character, as congestion or structural weakness is the more efficient cause of their accession. At this point, having arrived at something like a period, I may close the present essay.

I have to thank the Editor of this Review for the opportunity of laying before the profession certain propositions, and their application in the case of diseases of the lung. That I have given in this essay a mere outline of this application, and have altogether declined the discussion of other forms of disease after a like manner, is due to a want of sufficient time and space at my disposal, and in no way to want of will. This, however, is the less to be regretted, as I think we have the necessary facts already among us. On reviewing the number of facts collected during several years past in illustration of my own opinions, I find few that are not in possession of my readers. What is wanted is not so much a wider knowledge of phenomena as a change in the point of sight from which we regard them. As physicians, we are oppressed with an overlying weight of doctrine handed down to us from their worships the practitioners of physic of years past.[1] The science of biology being then non-existent, and scientific method barely understood, half fanciful and half metaphysical interpretations were the fig-leaves by which their ignorance

[1] Fortunately the study of abstract Physiology is passing out of the hands of those who have to study the applied science. Hitherto this science has flourished as astronomy and meteorology would flourish if left to sailors. Clearly their first classification would be a "pathology" of storms and eclipses.

was concealed. Although their interpretations are now mostly changed, yet much of the nomenclature and of the terminology belonging to them remains. When these are stripped off the truer lines of modern thought will become more evident; diseases will be seen in their real light, no longer as separate entities, but as conditions of existence; biology will swallow up pathology; and partial and fragmentary conceptions will be replaced by unity and consistency.

It will be a happy day for students when they are taught no more to see in the sick man a state made up of several diseases shaken together like bits of glass in a kaleidoscope; and when they are led rather to recognise in health, in disease, and in all the varieties of biological phenomena, but so many modes of being, and so many states of life.

ART. II.

Cases illustrating the Formation of Morbid Growths, Deposits, Tumours, Cysts, &c., in connexion with the Brain and Spinal Cord, and their Investing Membranes. With Observations. By JOHN W. OGLE, M.D. Oxon., F.R.C.P., Assistant-Physician and Lecturer on Medical Pathology, St. George's Hospital.

THE great importance which, for the most part and for various reasons, attaches to the subject of intra-cranial and intra-spinal morbid growths, deposits, &c., would appear to render even every individual instance of such maladies worthy of careful consideration and special remark. Considering the difficulties which not infrequently exist in ascertaining the presence of these diseases, difficulties which increase when we attempt their localization,[1] and which become still more formidable when we essay to discriminate one form of intra-cranial or spinal morbid growth from another, bearing in mind also how very frequently the symptoms accompanying such affections[2] are symptoms also of other diseased processes, such as hæmorrhage, dropsy, inflammation acute or chronic (whether in direct relationship with, or quite independent of the compression, irritation, &c. of the nervous structures incident to the presence of such growths or deposits), the assemblage and classification of, and the comparison between numbers of such cases cannot fail, I think, to prove a measure not merely affording very considerable interest, but one also productive of no little instruction.

Moreover, apart from the more general question of diagnosis—a question which must be regarded as fundamental, and essentially necessary as a basis for everything else in our thoughts touching the nature and cure of diseases—it cannot be gainsaid that very much which recommends itself as most serviceable and most assured in our physiology has been derived to us from the study of phenomena origi-

[1] The determination of which is a point earnestly to be desired, specially as respects the aid which we thereby obtain towards a correct prognosis.

[2] Modified as they doubtless must be by the exact situation, rate of increase, essential or anatomical character, and general mode of advance, &c., of the morbid production.

nated by the creation and progress of diseased action and morbid changes in previously healthy organs. And perhaps such good service cannot be rendered to physiological science by diseases and injuries of any organs so effectually as by those of the nervous structures—organs which are naturally so well protected that those who seek to arrive at a knowledge of the functions of their parts or elements by direct experiment run no little risk (owing to the inevitable injury of external structures and of adjoining parts of the same organs, the loss of blood involved, &c.) of confusing their results in manifold ways by the mutilation, but too often cruel in fact, and demoralizing in tendency, necessitated by their sacrificial operations.

Such reflections as the above furnish additional reasons of a weighty character for the collection, analysis, and careful collation, on as large a scale as possible, of diverse cases of disease in the organs referred to; and I trust that from the juxta-position and consideration of the cases I am about to relate, not only will a fair history of symptoms arising from such morbid changes be arrived at, but also that some interesting conclusions as regards their statistics, diagnosis, prognosis, complications, anatomical and histological characteristics, mode of progress, and habits, so to say, may incidentally result, particular reference being had to such modifications as might be expected from the age, sex, &c., of the patients afflicted, and the precise position of the part of the organ affected. Almost, but not quite all the cases which I will now proceed to record, occurred in the practice of St. George's Hospital during the past twenty-two years—that is, from the year 1841 to 1863 inclusive.[1] It will be seen that they are cases which (in well-nigh all instances) proved fatal eventually, and in which examination of the body after death was obtained, thereby furnishing in addition to "life symptoms," the various morbid appearances yielded by the scalpel or the microscope, by which means the cases acquire a value which they could never so completely possess if opportunity for post-mortem investigation of structural lesions had not been afforded; a result which is specially to be desired in cases where morbid psychological manifestations have been presented. Moreover, in delineating the appearances afforded by the *morbid alterations* revealed after death, I shall in many cases describe, and in some cases illustrate by means of woodcuts, the histological peculiarities of the morbid productions.

In arranging the various cases of morbid growths, deposits, &c., connected with the brain or spinal cord and their respective membranes[2] alluded to, I shall commence with such cases as illustrate the formation of those morbid productions which are the most frequently found within the cranium and spinal canal—that is, I. the "Scrofulous." I shall then pass on to II. the "Purulent," that is, to abscesses, en-

[1] Some cases will be found which did not occur in the hospital, but are derived from other sources.

[2] Not including, I may here observe, those cases which have resulted from simple inflammation, unconnected with any more specific morbid products, such as recently-effused fibrine or so-called lymph, thickening and opacity of the various investing membranes, an account of which I am at the present time preparing for publication, along with an account of all our fatal cases of cerebral and spinal hæmorrhage, &c. &c.

cysted or not;[1] then to III. the "Carcinomatous;" then to IV. the "Fibrous," "Fibroïd," and "Fibro-Cellular or Fibro-Nucleated;" then to V. the "Osseous" and "Calcareous;" then to VI., such as are exceptional or of uncertain character; then to VII., "Cysts;"[2] and VIII., "Affections of the Bloodvessels." In my relation of the cases I shall as much as possible observe a chronological order, enumerating them as they occurred in the various years; and whenever I find that any of them have been previously recorded by others or by myself, recounting them again very briefly, I shall particularize the references to such cases, so that statistics need not be interfered with by recapitulation.

I. Scrofulous Deposits.

Case I. *Scrofulous Masses attached to the Dura Mater: Similar Masses in various parts of the Brain.*—Mary B., aged twenty-one, admitted April 11th, 1831, having for two years been subject to great pain in the right eye, complaining of head-ache and vertigo, and continual and fixed pain in the abdomen, increased by pressure. The *left* pupil was contracted. About four weeks after admission the pain in the head was much more intense, and vomiting after meals came on. She had an epileptiform attack followed by delirium, and subsequently a second seizure. The left pupil became dilated before death, which occurred May 27th.

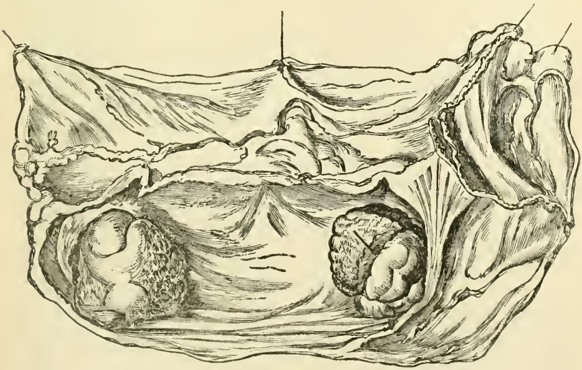

Fig. 1.

Post-mortem Examination.—Cranium: The cranial bones were thinned, the cerebral convolutions flattened, and the dura mater generally flattened. At-

[1] *Inclusive* of such as are connected with disease of the parietes of the cranial or spinal cavities, and also of such as are termed "secondary" in connexion with pyæmia and allied conditions of the blood, but *exclusive* of such as have been caused by direct external injury to the cranium or spinal column.

[2] Not including those cysts or cavities which are obviously the results of the absorption of extravasated blood, and connected with the reparation necessitated thereby.

tached to the inner surface of this membrane where covering the right lobe of the cerebellum, were two rounded masses of scrofulous material of about the size of hazel-nuts, and floating from their surfaces, which were rather lobulated, were portions of thin membranous substances, most likely remnants of the arachnoïd (see Fig. 1). Similar scrofulous masses were also found in the brain-substance itself—for example, one was embedded in the posterior lobe of the right cerebral hemisphere, another in the substance of the right lobe of the cerebellum, and one in the middle lobe. *Microscopical examination* of these masses after maceration for many years in spirit showed them to be composed of small cells, round or oval, containing granular matter, but no nuclei, also occasional club-shaped and a few large fusiform cells with granular contents embedded in granular amorphous material. The whole was rendered very faint by acetic acid. No fibres were found contained. *Thorax:* Scrofulous deposit met with in the pleural membranes. *Abdomen:* Scrofulous deposit on the peritoneum, also in the uterus and ovaries. The scrofulous masses attached to the inner surface of the dura mater are illustrated by the drawing.

Case II. *Scrofulous Miliary Deposits in the Pia Mater; Phthisis Pulmonalis. Softening of the Fornix and Pineal Gland.*—James McD——, aged twenty, admitted May 23rd, 1839, into Fort Pitt Hospital, with symptoms of pneumonia. More decided symptoms of phthisis came on before death, which occurred September 27th.

Post-mortem Examination.—Thorax: Pleural adhesions; lungs contained vomicæ and scrofulous deposit; similar deposit in the bronchial glands. *Abdomen:* Much serum and recent fibrine in peritoneal cavity. Liver contained a number of little cavities, apparently enlargements, with thickening of their walls, of the biliary ducts, full of a thick greenish fluid, the largest equal to a hazel-nut in size. Ulceration of the duodenum acteum. *Cranium:* Inner table of calvaria very thin and irregular, as if atrophied; and with numerous depressions on it, not corresponding to any such on outer surface. Much fluid beneath arachnoïd, and several minute granular scrofulous tubercles in the pia mater; lateral ventricles contained much fluid, and the fornix and pineal gland very softened.[1]

Case III. *Scrofulous Tumour attached to the Tentorium Cerebelli, pressing on the Cerebellum, &c. Epileptic Attacks.*—Samuel P., aged twenty-eight, admitted into St. George's Hospital June 3, 1844. Quite well until ten days previously, when slight headaches came on, and increased, chiefly affecting the forehead, aggravated by coughing or stooping. At first he had a slight "mist before his eyes," and pain at intervals in the left ear; but these symptoms subsided. Vomiting occurred once or twice. No tendency to drowsiness. Cough and mucous expectoration. Two days later the eyes became closed, as if he were unwilling to face the light, and in the night after he had an epileptic attack. Two attacks, called by friends "fainting fits," followed; also delirium at night. Then he had vertigo and double vision, followed by speechlessness. Consciousness diminished, and evacuations became voided involuntarily. Again he became fully conscious, and again delirious. He thus alternated until the 16th, when he had two convulsive fits, in the interval of which he was delirious and violent. Was more quiet before death, which occurred on the 17th.

Post-mortem Examination.—Cranium: Cerebral membranes dry and transparent, excepting occasional opacity; sub-arachnoïd at base of brain infiltrated by thick, firm, semi-transparent yellow material, chiefly about floor of third ventricle, pons Varolii, and medulla oblongata; membranes covering upper part of cerebellum opaque and thickened; lateral ventricles very dilated, and filled with clear fluid; corpus callosum and fornix, white, softened, and almost

[1] This case was placed in my hands by my friend Dr. John Davy, F.R.S.

diffluent, their connexions posteriorly destroyed; the surface of both optic thalami within lateral ventricles softened, but corpora striata *not* softened; venæ Galeni and Pineal gland and corpora quadrigemina surrounded by recent fibrine. To under surface of tentorium cerebelli covering right lobe of cerebellum was attached a tumour, consisting of a mass of scrofulous material (size of a hazel nut), which pressed upon and softened the cerebellum, to which it was partly adherent. *Thorax:* Apices of lungs studded with miliary scrofulous deposits. *Abdomen:* Organs natural. (140.)

CASE IV. *Scrofulous Tubercles in various parts. Softening of Left Cerebral Hemisphere. Hemiplegia of Right Side. Mind impaired.*—William W., aged thirty, admitted July 24, 1844, with diarrhœa of six weeks' standing, and occasionally passing blood in stools. Cough and expectoration. Shortly before death the *right* leg and arm lost all power of motion, and his mental faculties became impaired. He died exhausted, on Sept. 18th.

Post-mortem Examination.—*Cranium:* Visceral arachnoïd and pia mater opaque and thickened; turbid fluid beneath arachnoïd; brain firm, pale; several small crude scrofulous tubercles in various parts of brain, both in white and grey parts, but none in central parts or cerebellum. In the middle of the left hemisphere the brain substance was softened to the extent of three-quarters of an inch, and ecchymosed as if from small bloody extravasations. The base of brain showed nothing particular. *Thorax:* Old pleural adhesions; both lungs studded with miliary scrofulous deposit and vomicæ; one part in state of red hepatization; heart's walls thin and lacerable; cavities dilated. *Abdomen:* Cæcum and large intestine very ulcerated; scrofulous deposits in both kidneys. (201.)

CASE V. *Miliary Scrofulous Deposits beneath the Arachnoïd at Base of Brain. Arachnitis.*—Thomas R., aged four; admitted August 9, 1844. Emaciated, with much drowsiness; coma with dilatation of pupils came on, the eyes remaining wide open; strabismus preceded death, which occurred on the 20th.

Post-mortem Examination.—*Cranium:* Cerebral convolutions flattened; clear sub-arachnoïd fluid at vertex of hemispheres. At base, specially about floor of third ventricle, much transparent semi-concrete fibrine beneath arachnoïd. Whole of sub-arachnoïd tissues studded thickly with small miliary scrofulous deposits. No scrofulous deposit in brain itself. Ventricles full of clear fluid, and their parietes throughout, as well as all the central white parts of brain, very softened. Spots of extravasated blood found in the substance of the floor of the ventricles. Cerebellum rather softer than natural. *Thorax:* Both lungs and bronchial glands much occupied by miliary scrofulous material, and a single mass of scrofulous deposit found beneath the visceral pericardium. *Abdomen:* Most organs studded with scrofulous deposit. (183.)

CASE VI. *Scrofulous Deposits in the Pia Mater. Softened Septum Lucidum.*—Henry F., aged fourteen, admitted September 6th, 1844, pale and sickly, and affected by inflammation of the hip-joint. Articulation defective. Barely able to understand what was going on around him. Pupils of eyes very dilated, but regular, and equal, and active. No convulsive movements or want of power. Treated by steel and cod-liver oil. Subsequently was attacked by vomiting, and afterwards by loss of speech; but remained conscious, and looked up when addressed. On the day afterwards he could answer questions, but relapsed, and ever after was speechless. Did not appear to be in much pain except in the hip if moved; but he often raised the hand to the head as if uneasy there. Sphincters became paralysed, and he became quite unconscious, without any convulsions or rigors; sordes and great prostration preceded death, which occurred October 24th.

Post-mortem Examination.—Skin of entire body yellowish. *Cranium:* Dura mater very vascular. Cerebral convolutions flattened. Recently formed fibrine in sub-arachnoïd tissues on right side of brain; a miliary scrofulous deposit in pia mater of *left* side, chiefly along the course of the vessels. A few also at the base of the right cerebral hemisphere, and in choroïd plexuses. Cortex of brain dark, and white parts containing numerous bloody "puncta." Septum lucidum diffluent, containing, as seen *microscopically*, pus globules, and large oval granular bodies. Much ventricular fluid existed. Arachnoïd at base of third ventricle, and under part of cerebellum opaque and thickened. *Thorax:* Miliary scrofulous deposits in lungs. (332.)

Case VII. *Scrofulous Deposit connected with the Bones of the Skull.*—Eleanor R., admitted Sept. 4th, 1844, having had headaches for three years, and ascites and anasarca three months. Catamenia absent three months. On admission the abdomen was distended and painful; dyspnœa and symptoms of congestion and œdema of lungs. Urine very albuminous. Symptoms much relieved at first by cupping between shoulders, diuretics and expectorants. Acupuncture for anasarca appeared to have the effect of *relaxing* the bowels. Symptoms became aggravated, and eventually those of peritonitis set in. She died Jan. 6th, 1845.

Post-mortem Examination.—Cranium: Scalp very adherent; pericranium thickened and discoloured in patches of the size of half-a-crown; below those parts deposits of scrofulous material found, partly absorbing the external tables of bone, which in places were thickened, irregular, and mammilated, owing to new bone being deposited. Skull thick and hardened throughout, and without any diploë. Dura mater very adherent; inner surface of skull very vascular, and in places containing a few scrofulous deposits. Brain and membranes otherwise healthy. *Thorax:* Recent fibrine in pleural sacs, and œdema of lungs, which were quite free from any scrofulous deposit. *Abdomen:* Pus and recent fibrine in abdominal cavity; scrofulous deposit in kidney. Other organs natural. (8.)

Case VIII. *Scrofulous Deposits in the Left Crus Cerebelli.*—John F., aged twenty-seven, died May 9th, 1845, having only been ill a short time with violent headache followed by delirium and coma. The heart's impulse was very diffused. He sank and died in spite of leeches, venæsection, and blisters.

Post-mortem Examination.—Cranium: Cerebral membranes very injected; ventricles distended with clear fluid, their walls softened; fornix softened; mass of scrofulous deposit, size of a boy's "playing marble," beginning to soften, found embedded in the substance of the left crus cerebelli. A layer of bloodvessels separated the mass from the brain-tissue, which at this spot was very vascular. *Thorax:* Left ventricle of the heart hypertrophied, right one thinned; scrofulous deposit in the bronchial glands and connected with the pleura. *Abdomen:* Urinary bladder very distended.[1]

Case IX. *Scrofulous Mass in the Left Cerebral Hemisphere.*—R. H., aged twenty-five, admitted June 15th, 1846.—For two years subject to colds and coughs, and latterly to pain in chest. Rigors with pain in head and throat had supervened, and two days before admission slight delirium. Had never had hæmoptysis. When admitted his face was anxious, skin hot; hardly knew what he was saying; pupils moderately dilated, and acting well. Hacking cough, with mucous expectoration; large crepitations throughout chest; tongue dry, furred; no petechiæ of skin; pulse weak and quick; urine high coloured. Ordered ice to head. Purgatives and salines with relief for a time.

[1] The history of this case was given to me by my friend Dr. John Davy, F.R.S.

Continued until the 20th, when he became very delirious, and evacuations passed involuntarily. Sank into a comatose state, and died June 24th.

Post-mortem Examination.—Cranium: Semi-concrete fibrine found at base of brain and cerebellum; convolutions flattened; scrofulous mass (size of a bean), in posterior part of left cerebral hemisphere, and close to surface, enveloped in a firm cretaceous capsule. Surrounding brain healthy, but congested; ventricles dilated. *Thorax:* Lungs occupied by scrofulous deposit. *Abdomen:* Similar deposit in kidneys, spleen, and bowels; ulceration of cæcum, &c. (145.)

CASE X. *Scrofulous Mass in both Cerebral Hemispheres and in both Lobes of Cerebellum.*—Thomas H., aged nineteen, emaciated, admitted July 22, 1846, owing to disease of tarsal bones. For two weeks before admission had had much head-ache, and at times vomiting, having sleepless nights. Amputation of the foot performed, and *at once all sickness and headache ceased.* The operation succeeded, but the patient was often depressed and listless. Head-ache recurred, voice became husky, and articulation slow; pulse rose to 100; ordered ice to head and blister to occiput, and the speech and consciousness returned during the night. Afterwards memory and voice became more impaired, and eyes dull and half closed; and he had almost constaut head-ache. There was no return of consciousness; he died August 25th.

Post-mortem Examination.—Cranium: Large mass of scrofulous deposit found on surface of upper part of right cerebral hemisphere, penetrating for half an inch into the substance of the brain, but easily removable;[1] also on the outer part of left hemisphere, and near the surface was a small tubercle of same nature (of size of a pea.) Ventricles distended with serum, and their walls softened and septum destroyed. Two large masses, also, of scrofulous deposit occupied the posterior and lower parts of both cerebellar lobes (of about size of a walnut.) *Thorax:* Scrofulous deposit and vomicæ in both lungs. *Abdomen:* Mesenteric glands enlarged. (190.)

CASE XI. *Scrofulous Deposit at side of Medulla Oblongata, and in Substance of Sixth Cranial Nerve. Epilepsy, Paraplegia, and subsequently General Paralysis.*—William P., aged thirty-four, admitted Sept. 6, 1847, having been in good health up to seven weeks previously, when he had a fall from a scaffold, after which paraplegic symptoms at once came on. He got worse, lost consciousness, and became epileptic. Two weeks before admission he became maniacal, and for ten days had to be watched by attendants. This state subsided, and he remained partly idiotic and paraplegic; the fits continued many times a day. On admission was almost quite unconscious, was paraplegic and partly paralysed as to both arms. Urine dribbled away, and fæces passed involuntarily; muscles of face and tongue natural; urine ammoniacal, but free from pus or mucus; tongue furred; bowels confined; pulse weak. The "fits" continued twice or thrice a day. Ordered purgatives, counter-irritation to neck, and morphia at bedtime; catheter to be used. After a time sloughs appeared on the back, and pus was passed in the urine. A water-bed used, and bark and nitric acid, with opium and wine, given. He regained consciousness, but remained otherwise the same until death occurred, Oct. 17th.

Post-mortem Examination.—Cranium: Vessels of brain and membranes very congested; ventricles much distended with rather turbid serum. Mass of scrofulous deposit (size of small pea) found on the left side of the medulla oblongata, about one inch below the pons Varolii. This was in the substance of the areolar tissue, and had not made any visible impression upon the medulla. Another small and similar mass existed, apparently imbedded in the

[1] This specimen is described in St. George's Hospital Path. Catalogue as No. 34, Series viii.

substance of the sixth nerve on the *right* side, about half an inch previous to its exit through the dura mater. *Thorax:* Both lungs gorged, but crepitant. *Abdomen:* Liver congested. In one kidney much purulent fluid was infiltrated through its substance; lining of bladder inflamed and coated by phosphates. *Spine:* The cord was healthy. (243.)

Case XII. *Scrofulous Deposits in both Cerebral Hemispheres. Epilepsy.*—Henry H., aged five years, admitted Sept. 8, 1847, pale, dull, sickly looking, but had been in good health before he became the subject of fits, two years previous to admission. These generally occurred two or three times a week, and were almost always preceded by vomiting. For the last three months they had been very severe, attended by pain across the forehead. He constantly raised his hand to his head, and appeared unwilling to move. No intestinal worms had been ever known. On admission was senseless, and complained of pain in the head and belly, and of vomiting which came on after all meals, as also in the intervals; bowels costive, evacuations lumpy, tongue white; pulse 90, small and weak. Subsequently strabismus came on, and the vomiting ceased. He became semi-comatose in spite of blisters to the neck and cold lotions to the head. Pupils became dilated and insensible; and slight twitchings of face came on, but no fit. Gradually sank and died Sept. 23rd.

Post-mortem Examination.—Cranium: Vessels of dura mater and brain very congested; convolutions flattened; much serum in ventricles. Many scrofulous deposits in both cerebral hemispheres, superficial as well as deep, but brain around natural. Some of them were of size of a walnut, but none were softened; recent fibrine in sub-arachnoïd tissues. *Thorax:* Vomicæ in both lungs. *Abdomen:* Scrofulous deposit in liver. (197.)

Case XIII. *Scrofulous Deposits beneath Arachnoïd. Softening of Brain. Arachnitis.*—Timothy L., aged seventeen, scrofulous-looking and half-idiotic, admitted Nov. 10th, 1847, for hip-joint disease of three years' standing. After two weeks of so-called frequent "fainting fits," three distinct convulsive attacks came on, and also occasional retention of urine; later on, violent delirium set in, and several convulsive fits in succession; and afterwards noisy delirium at night, which was slighter in the day; pupils of eyes natural; pulse frequent, small, and irritable; tongue dry; profuse sweating came on, and he sank and died December 26th.

Post-mortem Examination.—Cranium: superficial veins of brain congested, and convolutions flattened; Pacchionian glands remarkably large; brain with many "puncta," on section, and ventricles distended with clear fluid; central parts of brain very softened; numbers of transparent scrofulous deposits, and also abundant recently-formed fibrine and serum in sub-arachnoïd tissue at base. *Thorax:* Heart flabby, cavities dilated; pleura adherent; vomicæ in lungs. *Abdomen:* pelvis of kidney, and mucous membrane of bladder very inflamed. Absorption of hip-joint cartilages found. (260.)

Case XIV. *Scrofulous Masses in both Halves of the Pons Varolii, Left Lobe of Cerebellum, &c. Paraplegic Symptoms.*—Frederick H., aged twenty-four, admitted Dec. 30th, 1847. Unconscious, having been ailing one month, but at work fourteen days previous to admission. Ten days before, without the occurrence of convulsion of any kind, he lost all motor power, and sensibility of skin to a great degree, in the legs, for a short time; the mind then remained unaffected. Next day he began to wander in mind, and had been unconscious ever since; no cough; general feverishness existed, and the pupils of both eyes were sluggish and contracted; pain in head often complained of; urine acid, free from albumen; sp. gr. 1022; no cough. Was ordered purgatives and salines. He became delirious at night, the pupils becoming still more contracted;

leeches to temples; counter-irritation to neck, and ice to head. He became quieter, but still unconscious; the pupil of *left* eye became more dilated, and slight strabismus came on; action of carotid very strong. He gradually sank and died January 2nd, 1848.

Post-mortem Examination.—Cranium: Brain-surface very dry, and convolutions flattened; purulent fluid in sub-arachnoïd tissues at upper and anterior of both cerebral hemispheres; many "puncta" on section of the brain; and ventricles very distended, with foramen of Munro very large; fornix and walls of third and fourth ventricle very softened; scrofulous mass (size of pea) found in both halves of the pons Varolii; that on the right being the largest, and beginning to soften. Several small and similar deposits in the left lobe of the cerebellum, situated both deeply and superficially; small scrofulous mass also attached to the dura mater and arachnoïd in the posterior fassa on the *left* side; slight amount of opaque serum in sub-arachnoïd tissues at base of brain. *Thorax:* Scrofulous deposits infiltrating both lungs, and vomicæ. *Abdomen:* Like deposits in kidneys and mesentery, with calcareous matter in the latter.

CASE XV. *Scrofulous Mass in Left Cerebellar Hemisphere.*—John M., aged eight, admitted Dec. 22, 1847, with scrofulous disease of hip-joint, which came on after a fall. Went on well until four days previous to death, when severe pain in abdomen, vomiting, and diarrhœa came on, after eating trash brought by friends; febrile symptoms set in; he became delirious, and passed evacuations unconsciously. He became almost comatose, screaming at intervals, and wine had to be given, and blisters applied behind the ears. Death occurred April 4th, 1848.

Post-mortem Examination.—Cranium: Lateral ventricles of brain distended with serum. In the *left* lobe of cerebellum was a small scrofulous mass, the surrounding brain being, however, natural. From the scrofulous hip-joint matter had escaped into the pelvis, where it was circumscribed by adhesions. (73.)

CASE XVI. *Scrofulous Deposit in Right Cerebral and both Cerebellar Hemispheres, and attached to the Dura Mater.*—Henry R., aged sixteen, admitted January 17th, 1849. Having scalded his leg in 1847, the sore never healed well; improved under good diet. On the 7th of April, he had a sharp pain at the left side of the head, so severe that he was unable to raise the head from the pillow. Double vision, and intolerance of light, and watchfulness, came on. Leeches to temples produced much relief to pain, and the double sight and intolerance of light disappeared. The pain was further lessened by counter-irritation. Exalted sensibility of skin of the shoulders, back, arms, and legs came on, and this to a very great extent. Physical signs of consolidation of the apex of lungs existed. Increased feverishness and pain at left side of head came on, and also irritability of stomach, and subsequently delirium, suffusion of eyes, and dilatation of pupils. Sank into semi-coma, with frequent screaming and gnashing of teeth, and tearing of bedclothes. The bladder and rectum lost power; pupils became still more dilated and inactive, and pulse more feeble and slower. In spite of counter-irritation, he gradually became insensible, and died May 1st.

Post-mortem Examination.—Right leg was contracted at right angles, owing to cicatrix of scald. *Cranium:* Cerebral membranes not very vascular; scrofulous mass (size of a pea) found attached to the right side of falx cerebri, near the superior longitudinal sinus, and another on surface of dura mater, covering the left inferior occipital fossa; slight sub-arachnoïd fluid; brain pale, firm; ventricles much distended with turbid serum. Here and there, in *right* cerebral hemisphere, scrofulous masses, varying in size up to that of a pea (and almost all in the cortical parts, or where the white and grey matter join) were met with; the largest were softer in their centres; none in the left hemisphere. Scrofulous masses also found in both cerebellar lobes as well in the circumference as the interior. One as large as a bean was connected with the grey matter of the under surface of the right lobe by means of a pedicle. *Thorax and Abdomen:* Scrofulous deposits in lungs and kidneys. (94.)

Case XVII. *Scrofulous Deposit in the Right Lobe of Cerebellum.*—Henry P., aged twenty-three, admitted May 16th, 1849, having, as it was thought, from exposure to cold, become "very weak," and having had hæmoptysis. No pain complained of; pulse was quick; tongue furred; perspiration great. He was evidently very inclined to drowsiness, and had had "strange fancies," and thought that he "saw people coming towards him." Slept soundly and well. Perspirations ceased under use of bark, wine, and aperients; but subsequently delirium came on, followed by shouting; and in the midst of this attack the nurse found him hemiplegic on the *left* side, and the tongue became protruded to the right. He gradually became quieter, but was still delirious. Ptosis of the left upper eyelid came on, and both pupils became permanently fixed, being neither dilated nor contracted. Urine became alkaline, passed involuntarily; sp. gr. 1034. Ordered salines and calomel with opium every six hours; cold applications to the head. Under this he became much quieter, but the hemiplegia of the left side became more complete; the right arm and leg being, however, kept in constant motion. After a time became again very delirious; the pulse rose to 130; and the urine, drawn off by catheter, was albuminous, containing blood globules and increased amount of phosphates. Both eyes then became turned to the right, but their axes remained parallel (i.e., no strabismus). More or less remained in state of stupor until complete coma came on, of which he died May 22nd.

Post-mortem Examination.—Cranium: Cerebral convolutions congested; brain generally softened, and showing many "puncta" on section. Lateral ventricles dilated with clear fluid, but their lining membrane appeared quite natural when examined *microscopically.* Fornix and septum of ventricles, however, softened. In the under surface of the *right* lobe of the cerebellum a mass of scrofulous deposit (size of a pea) was found. *Thorax:* Lungs congested, containing miliary scrofulous deposit; large cretaceous mass in bronchial glands. *Abdomen:* Scrofulous deposit in liver and kidneys. (107.)

Case XVIII. *Small Scrofulous Deposit in the Sub-arachnoïd Tissues covering the Left Lobe of Cerebellum.*—Alexander T., aged eighteen, admitted Nov. 21, 1849. Had been an in-patient for pain in head of two weeks' standing, at which time he had dilated pupils and enlarged cervical glands. Having been in hospital seven weeks, went out much relieved, and remained some time free from pain, but was again seized, and suddenly, with pain at left of thorax, also cough and increased head-ache, worse on lying down; the pupils were dilated and inactive; pulse firm and full; tongue coated white. On physical examination, dulness and fine crepitation were found at lower parts of lungs; and he was treated with antimony, and blood was drawn by cupping from the side, causing quick subsidence of pain. In spite of other remedies, iodide of potassium, mercury, and counter-irritation, &c., the pain in head continued, and he became comatose, and evacuations passed involuntarily. He died Dec. 6th.

Post-mortem Examination.—Cranium: Increased sub-arachnoïd fluid; ventricles dilated with pale serum; septum and fornix softened; mass of scrofulous deposit (size of mustard-seed) in sub-arachnoïd tissue, covering the *left* lobe of cerebellum. *Thorax:* Vomicæ in lungs; scrofulous deposit in pleura; false membranes and bronchial glands. *Abdomen:* Scrofulous deposits in peritoneum and kidneys; and ulceration of cæcum. (246.)

CASE XIX. *Scrofulous Deposits beneath the Arachnoïd Membrane. Softening of, and Blood Extravasated into, the Brain.*—Eliza G., aged three years, admitted February 24th, 1850. Child of a nurse in the hospital, always delicate, and subject to cough and cold, and latterly much emaciated. On admission, febrile symptoms very marked; anxious and depressed look; abdomen distended; tongue furred and dry; respiratory murmur harsh throughout lungs, and at bases with moist râles. Convulsions came on, relieved by warm bath; but next day she was semi-comatose; the face was dusky, and breathing difficult. Occasional convulsive movements in arms and hands came on, alternating with screaming. Gentle pressure on forehead caused quiet. Subsequently she became worse; strabismus and decided coma, and much screaming preceded death, which occurred February 26th.

Post-mortem Examination.—Cranium: Arachnoïd cavity contained 1½ oz. of clear fluid. Numbers of small, scrofulous deposits found beneath arachnoïd, covering both hemispheres, mostly on *right* side, and behind the parietal eminence, where extravasation of blood into the grey substance, and between it and the arachnoïd, had taken place. This did not reach the medullary part, but gradually decreased in quantity towards that structure. The medullary portion was, however, very softened, even diffluent, and of a yellowish colour. Brain rather "wet," and ventricles filled with clear fluid. *Thorax:* Scrofulous deposit in, and grey hepatization of, both lungs. Scrofulous deposit in bronchial glands. A few scrofulous masses also beneath the visceral pericardium. (39.)

CASE XX. *Scrofulous Deposit in Right Lobe of Cerebellum and in Floor of Fourth Ventricle.*—Elizabeth J., aged five years, pale and out of health, was admitted May 8th, 1850, with a view of being operated on for squinting, stating that the face had been slightly drawn to one side, and that she had had a slight squint for several weeks. The operation was, however, refused; febrile symptoms were severe, and the right eye was drawn upwards and inwards, and was very painful. Pain also complained of over whole of the head, and there was a certain degree of want of expression in the right side of the face. Tongue not protruded straight; urine free from albumen; bowels very confined. She lay quiet, and answered questions intelligently. Salines were given, and a blister, dressed with mercurial ointment, applied to her neck. After some days, something "like convulsions" came on in the night, and pain was referred to left side of head. Slight ptosis of the upper eyelid of the right eye followed, and purulent matter formed on the surface of the conjunctiva. She became very restless, the fever increased, and she had great pain all down the back. More frequent convulsions preceded death, which occurred June 3rd.

Post-mortem Examination.—Cranium: Cerebral vessels much congested; recently-formed fibrine in sub-arachnoïd covering the pons Varolii, and crura cerebri; ventricles distended with clear serum; pia mater of cerebellum particularly pale, compared with that of cerebrum. A small scrofulous mass found in cortex of the *right* lobe of cerebellum, and a second one, of the size of a filbert, in the floor of the *fourth* ventricle. About two-thirds of the latter were situated in the floor of the ventricle, whilst the remainder projected into its cavity: the portion of it situated on the *right* side of the *median* line being larger than that on the other side. These deposits were elastic, pale-greenish in colour, but not vascular. Remainder of cerebellum healthy. *Thorax:* Numerous miliary scrofulous deposits in lungs. Other organs of body healthy. (100.)

CASE XXI. *Scrofulous Deposit in the Cortex of Brain and Sub-arachnoïd Tissues at Base of Brain.*—Lydia B., aged twenty-one, admitted July 3rd, 1850, having had rheumatism two months previously, and having never quite recovered since. Complained on admission of pains in back, across hips, and down left thigh. Some fulness of right knee-joint existed, without any tenderness; tongue whitish; bowels confined; frequent nausea and vomiting. Ordered aperients and salines. Bowels opened freely, but evacuations very offensive. Head-ache and want of sleep complained of, and much relief obtained by renewal of purgatives. Intolerance of light, and increased pain at forehead, with much feverishness, came on, the pulse became frequent and oppressed, and the pupils dilated. Ammonia given, in addition, and morphia. Delirium, and afterwards double vision and deafness complained of. Eventually coma came on, and she died July 15th.

Post-mortem Examination.—Cranium: Cerebral vessels congested; much recently-formed fibrine in sub-arachnoïd tissues at base of brain; a few scrofulous masses also in the same tissues, and in the cortex; ventricles filled with turbid serum; fornix and septum softened. *Thorax:* Miliary scrofulous deposit throughout the lungs, and lower part of one lung very hepatized. *Abdomen:* Scrofulous deposit in kidneys and peritoneum; slight ulceration of colon. Other organs of body natural. (126.)

Case XXII. *Scrofulous Tubercles beneath Arachnoïd at Base of Brain. Epileptic Seizures.*—Charles B., aged eleven, admitted July 10th, 1850, having been ill since June 23rd with pain in head, owing, as it was said, to exposure to the sun. On the 26th had succession of "fits" lasting twelve hours. Said to have "worms," and generally to start in sleep and grind teeth, and to be subject to perspirations. On admission was scarcely conscious; pulse feeble and quick. Ordered ammoniated salines and wine. Shortly afterwards he had a series of epileptic attacks, lasting two or three hours; after that he was convulsed and unconscious; pupils became much dilated; tongue dry and furred; pulse very rapid. Calomel and purges given, and blister applied to neck. Subsequently had another fit, lasting several hours; and he fell into a semi-comatose state, with moaning, constantly grinding the teeth, and refused to lie on right side. Complete blindness, with very dilated state of pupils, came on, and sphincters became paralysed. He sank and died July 14th.

Post-mortem Examination.—Cranium: Slight recently-effused fibrine beneath arachnoïd at sides of cerebral hemispheres, chiefly along the course of the vessels and very much at base of brain. Many grey scrofulous tubercles, size of poppy-heads, attached to under surface of arachnoïd at base of brain and cerebellum; ventricles much distended with clear serum; septum, and fornix, and walls of ventricles much softened. *Thorax:* Scrofulous deposits in right lung. *Abdomen:* Similar deposits in spleen. (125.)

Case XXIII. *Scrofulous Deposit in the Upper Surface of both Cerebral Hemispheres. Softening of Brain.*—Julia W., aged twenty-five, admitted January 17th, 1851, having been long ailing with occasional pains in head. About two weeks previously vomiting and pain in head came on, and three days before admission, delirium and screaming. On admission the mouth was slightly drawn to the right, and the pupil of right eye unequally contracted, so as not to occupy the centre of the cornea. Pulse 72, full but unequal. Treatment consisted in purging enemata, cold to head, salines, and counter-irritation to neck. She was frequently convulsed; no sleep was obtained, and she remained delirious, but recognised friends; pupils remained as before; no urine was passed; bowels costive. Subsequently the face became flushed and of a dusky hue. Convulsions followed, and the left arm became paralysed, the leg being not involved. Though for some time conscious, so as to protrude the tongue, she sank and died January 21st.

Post-mortem Examination.—Cranium: Superficial cerebral vessels congested; dura mater at anterior of upper part of brain, for two inches and a half, and on both sides of longitudinal fissure very firmly adherent to brain; and there the grey matter was infiltrated by a mass of hard scrofulous material (of size of a walnut). Brain very softened on the *right* side as far back as anterior cornu of lateral ventricle, the lining membrane of which was floated out by water, which washed away surrounding parts; central white parts not softened. *Thorax:* Lungs congested; other organs of body natural. (113.)

CASE XXIV. *Scrofulous Deposits in the Right Lobes of Cerebrum and Cerebellum.*—James S., aged fifteen, admitted April 1st, 1851, a stable boy, who fell from a horse seven days previously, and struck his head, and was rendered insensible for two days. Afterwards remained subject to pain in the head and drowsiness. On admission was unwilling to be disturbed; face pale, tongue furred, white; pulse 56, laboured; skin cold and clammy; pupils dilated, but acting freely; tenderness of upper part of occiput on left side. Treatment consisted of cold applied to the shaven scalp, purging, calomel and antimony, and subsequently leeches. He became very talkative, and then violently delirious—moaning and sighing, but answered rationally when aroused. Evacuations became passed unconsciously; twitchings of limbs, and afterwards constant screaming and fixing of the jaws and strabismus set in; eventually drowsiness came on, and vomiting preceded death, which occurred April 11th.

Post-mortem Examination. — *Cranium:* Cerebral membranes congested; scrofulous deposits (size of peas) at under part of *right* lobe of cerebellum: of these one was close to surface, the other more deeply situated; membranes and brain-tissue around not involved. Also a third scrofulous deposit in *right* cerebral hemisphere. Lateral ventricles distended by clear serum. *Spine:* Cord, &c., natural. *Thorax:* Miliary scrofulous deposits in lungs; other organs of body natural. (71.)

CASE XXV. *Scrofulous Deposit uniting the Cerebral Membranes to the Brain. Softening of the latter. Epileptic Attacks.*—Thomas S., aged twenty-seven, admitted April 30th, 1851, having had epileptic attacks nine months previously. Illness began two weeks before admission with pains generally in the limbs; and two days before admission an erythematous eruption appeared on the skin. Pulse quickish; tongue white. Treated by salines and antimony. The eruption disappeared, and only pains in limbs remained. In about two days an epileptic fit came on, and recurred on the same day, and also on the two following ones. Subsequently he had a great number of fits, followed by unconsciousness; these recurred until death by coma, which occurred May 12th.

Post-mortem Examination.—*Cranium*: Dura mater thickened and adherent to brain and to the other membranes opposite left parietal eminence, the medium being a firm straw-coloured scrofulous mass, blended with the cerebral convolutions. The neighbouring brain-substance, grey and white, was softened, as also the central white parts. *Thorax:* Lungs congested, but free from scrofulous deposit. *Abdomen:* Organs congested. (100.)

CASE XXVI. *Scrofulous Deposits in the Right Optic Thalamus and Right Crus Cerebri.*—Sophia P., aged twenty-two, admitted February 25th, 1852, with abscess and strumous disease of shoulder-joint. Shortly after admission an attack of intense head-ache and unconsciousness came on, and this was succeeded by other and similar seizures. There was also strabismus, and the mouth was drawn to the right side; evacutions passed involuntarily. Under good food and stimulants she recovered, so as to leave the hospital, with occasional head-ache and a vacant expression of face; but was re-admitted with complete ptosis of the left upper eyelid and in a semi-comatose state, complaining of a "pricking" in both arms. In this state she remained eighteen days, but up to her death, when roused, she could recognise friends. Without any convulsions or further paralysis, she sank and died March 11th.

Post-mortem Examination.—Cranium: Much fluid existed beneath arachnoïd, and cerebral vessels very congested. *Right* optic thalamus occupied by scrofulous deposit, owing to which this ganglion filled up the entire right ventricle. This mass also pushed down the floor of the ventricle, so as to displace to the left side the optic commissure and corpora albicantia.[1] *Right* crus cerebri quite involved in the mass. *Thorax:* Scrofulous deposit in lungs. *Abdomen:* Kidneys contained numbers of cysts. (160.)

Case XXVII. *Scrofulous Deposits in both Cerebral Hemispheres.*—Louis M., aged twenty-nine, admitted March 3, 1852, having begun eight months previously to be ill with cough and "rheumatic pains," &c. On admission, was emaciated and subject to sweatings. Consolidation of the lungs on both sides was clearly established; pulse feeble, quick; tongue dry. Ordered ammoniated salines and Dover's powder. Pains in shoulder came on, and became so severe that he was unable to move the arm, which remained wherever placed. He had no sensation in the limb by which he could perceive its situation or position. Subsequently the affected arm became much swollen; appetite failed, and in spite of wine and tonics, &c., he sank and died May 17th.

Post-mortem Examination.—Scrofulous gland, resembling femoral hernia, found at upper part of right thigh. *Cranium:* Three scrofulous deposits found in brain—two in the *left* cerebral hemisphere (involving both grey and white matter), and one in the *right* hemisphere (only involving the grey matter). *Thorax:* Scrofulous deposit and vomicæ in lungs and mediastinal glands. *Abdomen:* Scrofulous deposit in kidneys. Liver contained a number of cysts, owing to distension of the bile ducts. (121.)

Case XXVIII. *Scrofulous Deposit in the Right Cerebral Hemisphere. Epileptic Attack.*—William G., aged six, admitted May 12th, 1852, with a heavy aspect and large head. For some months had been ill with abscess and disease of hip-joint. The abscess continued to discharge after admission, and later on he had an "epileptic attack," all the limbs being spasmodically affected. In spite of treatment he continued to have fits, often several in a day, and became delirious, frequently screaming. When he was rational, had no pain to complain of. He sank, apparently owing to the discharge, and died Sept. 25th.

Post-mortem Examination.—Cranium: Bones of skull well developed; sutures in good position; frontal suture partly obliterated; cerebral convolutions flattened; ventricles much distended; round mass of soft scrofulous deposit (quarter of an inch in diameter) at outer part of *right* cerebral hemisphere, near the middle of its lateral border. *Thorax:* Scrofulous deposit in lungs. *Abdomen:* Kidneys congested. (190.)

Case XXIX. *Scrofulous Deposit in the Choroïd Plexus and Left Cerebral Hemisphere.*—Bridget F., aged twenty-five, admitted August 27th, 1852, with pain in hip (thought to be rheumatic) and phthisical symptoms. After a time symptoms of acute inflammation of hip-joint set in, and she was treated by iodide of potassium and issues near the joint, and afterwards by opium. Improved for a time, until pain in the head and delirium set in, with moaning and watchfulness. The attacks had much of an hysterical character connected with them. Ordered blisters to the neck, and morphia. Subsequently strabismus came on, the *left* pupil becoming dilated and inactive, the *right* pupil remaining natural. Features became drawn to the right, and tongue protruded to the left; urine had to be drawn off. Great dysphagia came on, and loud and laboured breathing before death, which occurred March 24th. He was so far sensible to the last that he could be roused.

[1] Preparation of diseased optic thalamus exists, as No. 40, Series viii., in Path. Museum.

Post-mortem Examination.—Hip-joint found to be itself sound, but bursa over trochanter full of curdy matter, and having a very vascular lining. *Cranium:* Meningeal vessels congested; arachnoïd covering medulla oblongata, and the under surface of pons Varolii and cerebellum very opaque and thickened, and beneath was much recently-formed fibrine; brain generally rather softened, and full of bloody "puncta" on section; small scrofulous miliary deposit in choroïd plexus, and a rounded mass of scrofulous deposit (size of a pea) in centre of middle lobe of *left* cerebral hemisphere. *Thorax:* Miliary scrofulous deposit in lungs, and also in laryngeal mucous membrane, but no ulceration. *Abdomen:* Scrofulous deposit in kidneys and peritoneum, and in Fallopian tubes. (13.)

CASE XXX. *Scrofulous Deposits in the Sub-arachnoïd Tissues at the Base of Brain.*—Henry K., aged twenty-two, admitted Nov. 3rd, 1852. Said to have enjoyed good health until fourteen months previously (this statement, however, belied by his strumous look), when he experienced pain in the stomach, back, and loins, and since then in his limbs. No cough or night-sweats, but had had diarrhœa at the beginning of illness. For few days before admission had shivering, pain in abdomen, constipation, and dysuria, and on one occasion had passed "nothing but pure blood from the bladder." On admission, tongue was coated; pulse feeble, frequent; abdomen full, but free from external tenderness; bowels costive; urine free from albumen; no disease of bladder found on examination. Aperients, warm baths, and salines ordered. Headache and drowsiness came on, and he afterwards became partially conscious. The tongue, however, became very loaded, the pulse rapid and feeble, and he passed gradually into a state of delirium, the evacuations being voided involuntarily. Coma preceded death, which occurred Nov. 13th.

Post-mortem Examination.—Cranium: Fornix, septum of ventricles, and corpora quadragemina very softened; ventricles distended with limpid fluid; minute yellow scrofulous deposits under the arachnoïd covering the pons Varolii, and the under surface of cerebellum. *Spine:* Cord natural, but its arachnoïd almost universally was opaque, owing to presence of scrofulous deposit within the subjacent areolar tissues. *Thorax:* Vomicæ in lungs. *Abdomen:* Scrofulous deposit in kidneys. (228.)

CASE XXXI. *Scrofulous Deposit in the Sub-arachnoïd Tissues at Base of Brain.*—Sarah J., aged twenty, a healthy-looking girl, admitted Nov. 3rd, 1852, in a wandering state of mind, and said to have been ill ten days and to have gradually drooped with symptoms like fever. Ammoniated salines with chloric ether, and Dover's powder, ordered. There was tenderness of the abdomen, and subsequently head-ache and cough, with diarrhœa, came on. She wandered much at night; pulse became weaker and intermitting, and she gradually sank and died Nov. 10th.

Post-mortem Examination.— Cranium: Cerebral ventricles very distended with limpid fluid, and their septum "tattered" on its right side. Around the optic tracts, and corresponding to the "circle of Willis," the arachnoïd was opaque and very thickened and indurated, and contained deposits of scrofulous material. Among the fissures at base of brain and at upper and under part of the cerebellum numbers of miliary yellow scrofulous deposits existed. *Thorax:* Scrofulous deposit in lungs and beneath pleural membranes. *Abdomen:* Glands of ileum enlarged and ulcerated; scrofulous deposit in kidneys. (223.)

CASE XXXII. *Scrofulous Deposits in the Left Cerebral Hemisphere.*—Margaret C., aged forty-two, admitted February 2nd, 1853, having been rather weakly, but on the whole enjoyed tolerable health until two weeks previously, when pain in the right side came on. There had been no cough or hæmoptysis. On admission she was emaciated, with quick, feeble pulse, and feeble cardiac sounds. Auscultatory signs of consolidation of lungs existed, and three days later she was seized with a series of convulsive attacks, not followed by sleep. Next day she was found lying partially unconscious. In spite of counter-irritation to the neck, diuretics, &c., the convulsions persisted. Stupor came on, the eyes being turned upwards, and fixed, and the pupils inactive, and she gradually became comatose, resisting all attempts at movement. The urine was drawn off, and at one time (but not persistently) found to be albuminous. Dysphagia supervened, and she gradually sank and died February 9th.

Post-mortem Examination.—Cranium: Brain rather softer than natural, and very "wet." No undue amount of fluid in ventricles; masses of yellow scrofulous deposit (size of marbles) in back of posterior lobe of *left* cerebral hemisphere, occupying the white substance immediately beneath the convolutions; and a second mass (of half the size) on surface of back part of the posterior lobe on the same side in the grey matter. *Thorax:* Vomicæ in lungs. *Abdomen:* Intestines ulcerated; kidneys granular, &c. (30.)

Case XXXIII. *Scrofulous Deposits in both Lobes of Cerebellum. Extensive Caries of the Atlas and Axis.*[1]—Fanny B., aged four years, and healthy-looking, was admitted February 28th, 1853, having had a blow on the head three months previously, and since then become gradually ill. On admission the head was fixed, and drawn downwards nearly to the right shoulder. There was dyspnœa and dysphagia, and she would constantly wake out of sleep crying. No irregularity was perceived about the spine, and no pain on pressure. She improved on steel wine, and for a time her breathing became natural. Later on, dyspnœa returned, and became aggravated in fits, at which time *the respirations would not be more frequent than from four to five in a minute.* During the last few days of life, she supported her head with the hands when moving it. She retained her senses until two days before death, when she became comatose. She died April 14th.

Post-mortem Examination.—Cranium: Much clear fluid beneath arachnoïd and in ventricles; cerebral convolutions flattened; two large yellow and rounded scrofulous masses (smaller one equalled a large nut in size) found in central part of *right* lobe of cerebellum. These were firm externally, but softened inside. A smaller mass also in *left* cerebellar lobe. *Spine:* Articular surfaces between atlas and axis on the right denuded of cartilage, and the bones rough and carious, but *not* softened. Right transverse process of axis rough and carious, and part of the canal for passage of the vertebral artery quite destroyed. Capsular and posterior atlanto-axoïd ligaments ulcerated; transverse ligament entire, and odontoïd process not at all displaced. Large abscess found between the vertebral column and the pharynx, situated more on the right side than the left, and this communicated with the diseased joint of the atlas and axis. None of the neighbouring nerves and vessels appeared implicated; spinal cord and membranes natural. *Thorax:* Scrofulous deposit in lungs. *Abdomen:* Similar deposit beneath peritoneum. (82.)

Case XXXIV. *Cyst, apparently of Scrofulous Nature, in the Pons Varolii, indenting the Cerebellum and pressing upon the Cranial Nerves.*—Maria P., aged eighteen, admitted March 16th, 1853, having had good health until two months previously, when, owing as was thought to cold, she was affected with giddiness and pain at forehead, and then by turns "numbness and tottering" of the *left* side of the body. At the same time the sight of the *right* eye began to fail, and the *right* side of face to be numb. Double vision was also experienced. The giddiness and numbness had continued; and for two weeks before admission she had been deaf with the *right*

[1] For an account which I have recently given of certain other cases of caries of the upper cervical vertebræ, see Trans. of Path. Society, vol. xv.

ear. On admission, the muscles of the left side of the face were paralysed: there was loss of power in the *left* arm and hand, and in the left leg. The skin of the whole of the left side, as high as the middle of the neck, was very deficient in sensibility. Right arm and leg natural. Conjunctiva of right eye very vascular; convergent strabismus of right eye which could not be abducted; its pupil rather contracted. Left eyeball natural; its pupil rather dilated. There was dysphagia and noisy inspiration. Mental faculties natural. Treated by aperients and mercury. After two weeks she became very obtuse, and vomiting occurred, followed by much pain in the head. After what was termed a "fainting fit," unconsciousness came on with collapse, foaming at the mouth; and after much bronchial rattle she died May 8th.[1]

Post-mortem Examination.—Cranium: In *right* portion of the pons Varolii a cyst (half the size of a pigeon's egg) was found, having thin and friable walls, and full of a glairy fluid, containing numbers of albuminous particles, and lined by a delicate but firm membrane. This cyst extended outwards about three-quarters of an inch; also forwards and backwards, so as to indent the right lobe of the cerebellum, interfering by pressure with the fourth, fifth, sixth, and seventh pair of cranial nerves on same side. Arachnoïd in neighbourhood of cyst opaque and thickened. Lateral ventricles distended by clear fluid. Other parts of the body natural.[2] (101.)

CASE XXXV. *Scrofulous Deposits in the Right Crus Cerebri, both Cerebral Hemispheres, and Right Cerebellar Lobe, &c. Hemiplegia.*—Joseph B., aged four, admitted March 23rd, 1853, two months before having had hooping-cough, but having been very weak since, though previously healthy. On the 15th he began to experience "faintness," and soon after lost the use of the *left* side and became blind. No convulsions, loss of consciousness, or delirium had existed. On admission the skin was dry and harsh; pulse rapid and feeble; breathing hurried, but free from cough; and there was incomplete loss of power of *left* arm and leg; muscles of face unaffected. There was also scrofulous ophthalmia, and the pupils were dilated and inactive; no winking when objects were brought to the eye, unless the eyelashes were touched. Physical signs of scrofulous deposit in lungs existed. Small quantities of mercury were given, and mercurial ointment rubbed in along the spine; and leeches were applied to the temples. It became difficult to obtain from him replies to questions, though he remained rational and free from convulsions. The affected arm and leg became in time stiffened and drawn up, but he did not regain power in moving them. He gradually sank, and died April 12th.

Post-mortem Examination.—Cranium: The skull and brain both very large, and much sub-arachnoïd and ventricular fluid existed; posterior lobe of the *right* cerebral hemisphere vascular and softened, and in the substance of the brain at various parts scrofulous deposits found; the largest (size of walnut) existed in *right* crus cerebri; another (half this size) in *right* lobe of cerebellum. Others, smaller in size, in the cortex of both cerebral hemispheres. *Thorax:* Scrofulous deposit in lungs and bronchial glands. *Abdomen:* Similar deposit in spleen and beneath peritoneum. (77.)

CASE XXXVI. *Scrofulous Deposit in the Medulla Oblongata and Pons Varolii, &c. Brain Softened.*—Sarah H., aged eighteen, admitted April 1, 1853, having for three years had head-ache, attended of late by double vision. On admission,

[1] See Trans. of Path. Soc. of London, vol. v. p. 26; also Br. and For. Med.-Chir. Rev., Oct. 1859, p. 505.

[2] This preparation also described in St. George's Hospital Path. Catalogue, Series viii., No. 42.

in addition to head-ache there was diarrhœa and abdominal tenderness, frequent weak pulse, and foul tongue. She had a peculiar oscillating movement of both eyeballs, especially the right one, and decided "coldness" of the *left* upper limb, attended by numbness. This coldness and numbness, she said, had existed for twelve months. Urine free from albumen. Treated by aperients, salines, and counter-irritants to back of neck. After a time she had a difficulty in moving the head, and a kind of semi-stupor came on: finally dysphagia and indistinct articulation. She died six months after admission.

Post-mortem Examination.—Thorax: Lungs contained much scrofulous deposit. *Abdomen:* Ovaries and Fallopian tubes also contained scrofulous deposit. *Cranium:* A mass of scrofulous deposit was found (of the size of a hazel-nut) in the centre and posterior part of the right portion of the medulla oblongata projecting into the ventricles, about one-eighth of an inch in thickness of its anterior surface being left entire. Another similar deposit, of like size, was found in the anterior or lower and right portion of the pons Varolii. Cerebral structure around each deposit very softened; smaller scrofulous deposits also found in different parts of the grey matter of the posterior portions of the brain, and softening of the crura cerebri. Ventricles and sub-arachnoïd tissues full of clear fluid; cerebral membranes natural.[1] (113.)

Case XXXVII. *Scrofulous Deposit mixed with Calcareous Matter in the Velum Interpositum.*—Anne S., aged thirty-six, admitted April 5th, 1853, having been ill since the 31st of March, and said to have had vomiting, with intense head-ache and high febrile symptoms. Ordered salines, mercurials, and a purgative enema, which only brought away a small lumpy stool. The tongue became dry and foul, head-ache became worse, and nights very disturbed. No good resulted from opiates. The intellect became more confused; the *right* pupil more dilated than the other; respiration hurried, and face blue. Collapse preceded death, which occurred April 14th.

Post-mortem Examination.—Cyst full of scrofulous matter (half size of an orange), found at back of shoulder, about middle of posterior edge of scapula, chiefly among superficial muscles of back; also collections of pus along the trapezius muscle, and one traced to a collection within the chest, passing above and below the third rib, which was carious at its posterior part. *Cranium:* Arachnoïd veins congested, and cerebral convolutions flattened; vessels of brain on section, congested; ventricles distended with clear fluid, and their lining membrane presenting numerous small granular prominences. In the "velum interpositum" was a soft yellowish mass of scrofulous deposit, mixed with calcareous matter; central white parts of brain much softened; arachnoïd covering cerebellum opaque, thickened, and at base of brain of a yellowish hue, and more thickened still. *Thorax:* Scrofulous deposit in lungs, bronchial and mediastinal glands, and in false pleural membranes; beneath the pleura lining the posterior and upper part of right side of thorax was a collection of curdy-looking scrofulous matter, continuous with the collection of pus among the muscles of back before described. *Abdomen:* Ulceration of ileo-cæcal valve. (81.)

Case XXXVIII. *Scrofulous Deposit in the Right Lobe of the Cerebellum, Facial Paralysis on the same side, Effusion into the Cerebral Ventricles.*—James L., aged twenty-four, of unhealthy family, subject to head-aches, and with scars on the neck, was admitted August 10th, 1853, having had a recent attack of bronchitis and pain at the chest, and having had dyspnœa and palpitation of

[1] Preparation described in Trans. of Path. Soc. of London, vol. vi. p. 40; also British and For. Med.-Chir. Review, Oct. 1859, p. 508; also in St. George's Hospital Pathological Catalogue, Series viii. No. 41.

the heart ever since he had rheumatic fever, five years previously. Under treatment he gradually got in all ways much better, when on the 22nd he was attacked by shivering and much pain in the head, which increased in spite of purgatives, salines, and leeches to the temples, and became attended by occasional "double vision" and vomiting. Delirium and drowsiness succeeded, and the pain in the head became complained of chiefly on the *right* side. The aspect became vacant, the memory deficient. There was at first no loss of power in the limbs, and the urine was free from albumen. There was a systolic bruit at the heart. Later on, the mouth became slightly drawn to the left, and movement of the right ala nasi became almost lost; the tongue was protruded in a straight direction. At the latter end of August he became subject to "heats and chills." He was delirious at nights, and there was unusual pulsation of the carotid and facial arteries; during sleep the eyelids were only imperfectly closed, but very slight reflex action could be exerted in the left, and absolutely none in the right eyelid. In September the evacuations became passed involuntarily, the right pupil dilated, and the skin of the belly very tender. Later on, both pupils became very inactive, and without any loss of power in the limbs or apparent modification of sensibility of the skin, dyspnœa came on, with effusion of mucus into the bronchial passages, and complete insensibility before death, which occurred September 3rd. Shortly before death both pupils became very much contracted.

Post-mortem Examination.—The toes were found firmly outstretched, and the pupils dilated but equal. *Thorax:* Fibrinous exudations, old and recent, were found in the pleural cavities, and the lungs, which were congested, contained much scrofulous deposit. The heart was hypertrophied, and its valves on the left side thickened. *Abdomen:* The kidneys were congested. *Cranium:* The veins of the arachnoïd were very congested, and the cerebral convolutions flattened. On section, the "puncta" of the white parts were very abundant and large, and the lateral ventricles distended with turbid fluid, but not much increased in size. The septum and fornix very softened; the arachnoïd at the base of the third ventricle was very thickened, and under-laid by thick yellow fibrine; corresponding to this recently-formed fibrine, and occupying part of the *right* lobe of the cerebellum, and appearing at its surface was a quantity of light brimstone coloured purulent fluid, surrounded in part by a mass of firm, scrofulous, yellow-coloured material. (187.)

CASE XXXIX. *Scrofulous Deposit beneath the Arachnoïd, chiefly on the Left side of Brain. Ventricles full of Turbid Fluid.*—Sayer B., admitted Jan. 24, 1855, having for some time been ailing, and having lived poorly. Was much emaciated, and had had pains in abdomen and diarrhœa for three months. On admission general and specific indications of phthisis existed. He continued to become weaker, and duskiness and anxiety of face came on. He died on the 8th Feb.

Post-mortem Examination.—Legs flaccid, arms rather rigid. *Cranium:* Arachnoïd surfaces within longitudinal fissure smeared over with recent fibrine; much scrofulous deposit beneath arachnoïd, especially at outer and lower parts of left cerebral hemisphere; fornix softened: brain otherwise natural. Ventricles full of turbid fluid, containing, as determined *microscopically*, pus globules and particles of brain-tissue, coagulated fibrine, débris of epithelium, and a few nucleated fusiform cells. *Thorax:* Scrofulous deposit in both lungs and bronchial glands. *Abdomen:* Adhesions between various viscera, containing, most of them, scrofulous deposits; ulceration of ileum. (45.)

CASE XL. *Scrofulous Deposit on the Upper Surface of the Cerebellum.*—Sarah A., aged twenty-eight, admitted April 2, 1855, having "taken cold" three weeks previously, but having had an abscess discharging in the neck for twelve months. Nine days before admission she had shivering, sickness, aching of limbs, and pain along the œsophagus. It was stated that strabismus and deafness had existed. On admission there was vomiting, which was allayed by medicine. Head-ache, however, continued, with febrile symptoms, dilatation of the pupils, abdominal tenderness, and constipation. The urine was also albuminous; in spite of salines and aperients, which brought away offensive motions, she became more restless, and convergent strabismus of the *left* eye became well marked. Later on she groaned much and wandered at night, and in spite of treatment she fell into a comatose state, and so continued until death, which occurred on the 6th.

Post-mortem Examination.—Cranium: Arachnoïd covering pons Varolii thickened; scrofulous deposit found on upper surface of cerebellum, and cerebral convolutions flattened; much fluid in the lateral ventricles; central white parts of brain softened. *Thorax:* Scrofulous deposit in lungs, and under visceral part of pericardium, the layers of which were very adherent. *Abdomen:* Stomach softened; kidneys congested. (105.)

Case XLI. *Scrofulous Deposit in Optic Thalamus, in the Cortical parts of the Brain, and in the Cerebellum, &c.*—Emma R., aged two years, admitted April 14, 1855, having been always delicate and cachectic since she was weaned, and one year previously having had measles. Eleven days before admission she became worse, lost appetite and animation, and became very thirsty. Day before admission had an attack of convulsions. When admitted the pupils were dilated, and when asleep they were very rarely closed, but reflex action was considerable when eyelids were touched. Divergent squinting of right eye; head hot; tongue white; bowels costive, and motions light-coloured. Pulse 136; respirations 38 per minute; facial muscles natural. Treated by calomel and antimony, and blister to the neck; but in two days the limbs became very convulsed, especially at first the left side, then the opposite one. This state continued several hours, leaving her very weakened. Afterwards there was dysphagia and occasional starting from sleep, but no screaming or struggling. She died on the 18th of April. Immediately after death the pupils of the eyes were contracted, but some hours afterwards they were dilated.

Post-mortem Examination.—Cranium: Cerebral convolutions flattened and dry; arachnoïd here and there, containing yellow patches. A small scrofulous deposit found in the cortical part of the posterior and outer portion of the left cerebral hemisphere; and a larger one found in the middle of the right optic thalamus; also, some like deposits in the middle of both lobes of the cerebellum. There was softening of corpus callosum, fornix, septum lucidum, and walls of ventricles; and recently-formed fibrin in subarachnoïd tissues at the base of the brain. *Thorax:* Scrofulous deposit in lungs. *Abdomen:* Like deposit in kidneys, liver.

Fig. 2.

Microscopical Examination of the contents of the ventricles showed numbers of bodies like those in Fig. 2—viz., (*a*) nuclear irregular forms, and (*b*) large, oval and rounded, and elongated cells with nuclei within, and here and there curiously bottle-shaped structures having double contours. (115.)

Case XLII. *Scrofulous Deposit beneath the Arachnoïd. Arachnitis, Softening of Walls of the Ventricles.*—Thomas R., aged twenty-two, admitted April 18, 1855. Had been well until three days before Easter Sunday, when suffered much pain in head, and giddiness. On Easter-day, unknown to friends, he went away and got married, and immediately after was obliged to take to his bed, owing to pain in the head. On admission he was half-stupid, but could be roused, and complained of pain across the eyes; eyelids half-closed when looking up. Convergent squint of right eyeball, which at times oscillated; and tremor of right orbicularis muscle, and slightly so of the muscles of the right side of the face. Puffing of right buccinator muscle; pupils natural, excepting being perhaps somewhat dilated. Features rather drawn to the left; at times tremors of the muscles of the hands, and gasping for breath. Could move all his limbs, though tardily; and said they were "lear." Articulation affected, some words being spoken quickly and sharply, others slowly and indistinctly. At times he forgot where his home was, and seemed impatient at being asked questions. Sensibility of skin as to touch generally natural; urine albuminous; no dysphagia. Stethoscopic examination suggested the occupation of the upper part of the left lung by scrofulous deposit. Three days after admission, having passed a restless evening, he could not well be roused or made to protrude the tongue, and there was evident dysphagia. The right hand and arm were almost powerless, and the tactile sensibility impaired, but not abolished. No reflex action in right arm. In the course of the day the arm became gradually flexed, and the hand drawn up to the ear. The left hand was often held up to the eyes, as if the more easily to regard some object. Right eye half closed; left one three-quarters closed; sight evidently defective; right eyeball also often twitching inwards, and its conjunctiva vascular and covered with purulent fluid. Right eyelids not contracting when blown upon. Pupils equal, but sluggish. Picking with the hands, especially left one, came on, and the mouth was more decidedly drawn to the left. Facial artery beating very visibly on the right side of face; *not so on the left.* Pulse 106. It was stated by the nurse that he had complained of seeing objects *tripled or quadrupled;* later on he appeared to know his wife. He then became violent, but subsequently quieter before death, which occurred on the sixth day after admission.

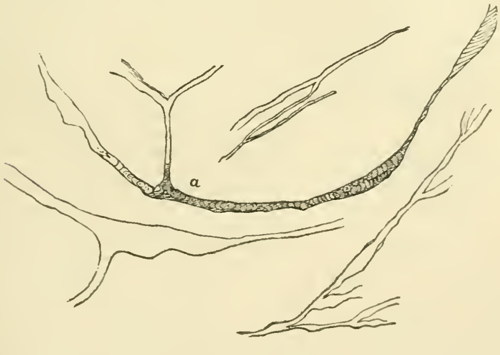

Fig. 3.

Post-mortem Examination.—Cranium: Cerebral sinuses and veins very full of clot, but no great number of "puncta" on section; brain rather softened generally. Yellow soft fibrine under arachnoïd at outer side of left cerebral hemisphere, and also a few small scrofulous deposits. Three or four soft yellow scrofulous deposits (size of mustard-seeds) were met with under the arachnoïd, covering external surface of right cerebral hemisphere: the grey matter beneath being vascular. Ventricles distended with clear fluid, and surfaces of optic thalami and corpora striata softened; thickening of arachnoïd at base of third ventricle. *Thorax:* Lung hepatized at lower part. *Abdomen:* Bladder distended.

Microscopical Examination: The grey cerebral structure in the immediate neighbourhood of the scrofulous deposit on the surface of the brain showed a large number of bloodvessels affected by dilatations and uneven "bulgings," as seen in the accompanying figure, No. 3. The pia mater, also, in the vicinity presented a number of capillary vessels in the same condition, though to a less degree. (185.)

Case XLIII. *Scrofulous Deposits in various parts of the Brain. Ventricles distended with Turbid Fluid.*—Mary F., aged seventeen, admitted June 6, 1855. Of healthy family; she had also been healthy until two and a half years previously, when she came to London. For fifteen months, when first in London, she never menstruated: then the catamenia came on suddenly, and lasted for two weeks, re-appearing and ceasing two or three times, followed by head-ache, and languor and strangeness of manner, and dislike to certain articles of furniture around her. On admission there was pain in the right temple and hesitation of speech, with contraction of the pupils. She appeared, after application of leeches, and salines and aperients, to be better for a time; but wandering of mind came on at night, with screaming and restlessness, and with occasional inability to give rational answers. She was placed under the action of mercury, and a blister applied to the neck. She, however, became more violent, and startings of the limbs came on. Albumen existed in the urine, and she became almost comatose. Evacuations passed involuntarily, and she died five days after admission.

Post-mortem Examination.—Legs uniformly rigid and extended. *Cranium:* Cerebral convolutions dry; scrofulous deposit in upper and posterior parts of both cerebral hemispheres, and also over whole of the surface of the cerebellum; much soft recent fibrin in subarachnoïd spaces at base of brain, and arachnoïd opaque and thickened; ventricles very distended with turbid fluid: their walls very softened. *Thorax:* Scrofulous deposits in lungs and bronchial glands; other organs of body natural.

On examining microscopically the softened walls of the ventricles, it was found that in addition to nerve-tubes very many round corpuscles, slightly granular, and of the size of pus-globules, were to be seen; also some oval and some more elongated forms. Others of much larger size, with very delicate, granular, yellowish contents existed. A slight amount of granular matter also existed, and here and there a few irregular-shaped garnet-coloured bodies. These appearances are presented in the accompanying woodcut. (Fig. 4.)

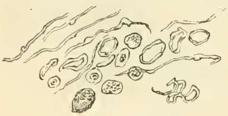

Fig. 4.

The turbid fluid within the ventricles contained numbers of very large, delicate, nucleated cells—see Fig. 5 (*a*); also cells like pus-cells (*b*); epithelial cells (*c*); fatty bodies or cells (*d*); garnet-coloured bodies (*e*); double-contoured bodies from the centre of nerve tubes (*f*); very delicately-formed, rounded, non-

Fig. 5.

nucleated cell-forms (*g*); and large pale cells, with their walls much thickened around nucleus.[1] (181.)

CASE XLIV. *Scrofulous Deposits in various parts of the Brain and Cerebellum.*—Joseph P., aged thirty-nine, admitted January 30th, 1856. An intemperate billiard-marker, whose health was considered tolerable until eight months previously, when he was seized with some sort of a "fit," and lost consciousness for ten minutes. Six weeks later he had another and similar attack. For one month he remained feeling comfortable, when he had another seizure. On admission, the pulse was 116, and weak; urine very albuminous, with sp. gr. of 1008. Cough, with muco-purulent sputum, and physical signs of scrofulous deposit in lungs. Subsequently drowsiness and sallowness of the skin came on, and dyspnœa, with pain in the chest. The scalp became very hot, tongue dry, pulse very irregular, and urine scanty; sputum very purulent, &c. He died February 10th.

Post-mortem Examination.—Cranium: Arachnoïd thickened and opaque, specially about the floor of the third ventricle, with turbid sub-arachnoïd fluid. Vessels of brain very injected. Numerous scrofulous deposits existed in brain, as follows: 1st, one of the size of a pea in the middle of the *left* cerebral hemisphere, on a level with the corpus callosum; 2nd, another, a larger mass, in the posterior part of the right cerebral hemisphere, immediately beneath the grey matter; 3rd, a mass (size of filbert), in the middle of the right lobe of the cerebellum, quarter of an inch from surface; 4th, a smaller one, to the right of the last one; 5th, a very large mass in the pons Varolii, occupying the central part, and only just not appearing at the floor of the fourth ventricle. Lateral ventricles full of limpid fluid; their boundaries firm. In all cases the scrofulous deposit could be easily enucleated, *and was covered externally by a firm network of bright vessels,* the brain around being natural as to consistence. The larger deposits were beginning to soften in their centres.

Microscopical Examination.—The outer parts of the scrofulous masses contained a large amount of granular fatty matter, and only a few cell-forms; whilst the softened parts contained very little fatty matter, but great numbers of oval and round cells, of about the size of blood-globules, a few containing nuclei, and also a few double-contoured formations, like rings. No fibres or blood-vessels were contained. The brain around the deposits appeared quite natural. The thin vascular coating seen by the eye around the deposits was found to contain large blood-vessels, which, in places, *were rather bulging as to their walls,* some of the vessels being $\frac{1}{1200}$th of an inch in thickness, whilst the bulgings were $\frac{1}{1000}$th. Most of the vessels were, however, smaller; no fat was seen around them. *Abdomen:* Scrofulous deposits in spleen and kidneys, which were granular. Peritoneum covered in places by white granulations, found by microscope to contain numerous oval non-nucleated cells, and granular material.

Fig. A in accompanying Plate illustrates the scrofulous deposits in the medulla oblongata and cerebellum surrounded by the network of bright blood-vessels, as described above. (214.)

CASE XLV. *Scrofulous Deposit beneath the Arachnoïd. Arachnitis.*—John R., aged twenty-six, admitted February 20th, 1856. Had had pain in the head for one year, but his history was imperfect, and had had a "fit" four days before admission. He was then constantly moaning and very tremulous; teeth were clenched; pupil of *left* eye dilated, that of right one contracted; urine passed involuntarily; pulse small and feeble. Ordered a purgative enema, with ether and ammonia, and cold affusion to the temples.

[1] This kind of cell-formation I have more than once seen in the substance of certain intra-cranial tumours, to be described in a subsequent series of Cases in this Review.

Afterwards wine was given, and he was also cupped on the temples. Symptoms continued much the same. He became unconscious, and the pupils became fixed; he sank and died on the 23rd.

Post-mortem Examination.—All limbs rigid; right pupil contracted; left one dilated. *Cranium:* Left half of skull found to be smaller than the right; cerebral veins and sinuses nearly full of blood, and convolutions flattened; brain-substance very injected, and lateral ventricles distended with turbid fluid, their walls being much softened. Soft, recently-formed fibrine in sub-arachnoïd spaces at the base of the brain, and arachnoïd thickened. Numbers of miliary scrofulous deposits studding arachnoïd in many places at the base of the brain. *Thorax:* Vomicæ in lungs.

Microscopical Examination of the softened parietes of the ventricles showed the presence, along with nerve-tubes, of round, slightly-granular corpuscles, of the size of pus-globules; also oval and elongated corpuscles; also others very pale and large, with delicate, granular, yellowish matter inside, and occasional small masses of a red garnet colour. No vessels in a fatty state were found. The turbid fluid in the ventricles contained a number of cell-formations. (39.)

Case XLVI. *Scrofulous Deposit beneath the Arachnoïd. Arachnitis.*—Elizabeth W., aged eighteen, a hard-working servant, admitted April 30th, 1856. At two years of age, said to have had "water on the brain" when teething, and since the age of eleven always been subject to headache after the least excitement, and always a "hard sleeper." Subject to tooth-ache; had a brother who was epileptic, but family history otherwise good. For two weeks had been "low in spirits," having had much trouble in her "place," and having to rise at 3 A.M. On the 28th had constant head-ache, and next day vomiting of bile, lasting twenty-four hours. When admitted, the tongue was foul, pulse 112, full and compressible; skin warm and moist; scalp hot; bowels costive. Ordered leeches to the temples, and James's powder and calomel. At night had to have a separate bed-room, owing to constant noise and singing, and after this was never again rational. Evacuations became passed involuntarily, and later on there was much groaning on expiration, and occasional stertor, the respiration being 41 per minute, and at times almost arrested for three or four respirations. The conjunctivæ became vascular. On the 1st of May, convergent strabismus of the left eye came on, and the pupils were contracted, and only slightly acting, though doing so quickly. All the limbs moved at times. Divergent strabismus of the right eye came on, and also slight facial paralysis on the right side, along with dysphagia. The pulse was at this time scarcely to be counted. She gradually sank and died on that day.

Post-mortem Examination.—Cranium: Arachnoïd in places thickened and much soft recent fibrine beneath this membrane at the upper and lower parts of both cerebral hemispheres. In places, arachnoïd adherent to the brain-tissue by means of scrofulous deposit situated in the pia mater. Ventricles distended with clear fluid; the parts around them firm. *Thorax:* Cicatrix in one lung on the surface, but no deposit in lung correspondent. Spots of ecchymosed blood under the lining of the left ventricle of heart. *Abdomen:* Ecchymosis of blood beneath the lining of the stomach. (961.)

Case XLVII. *Scrofulous Deposit in both Cerebral Hemispheres and in Cerebellum.*—Mary S., aged twelve, admitted July 19th, 1856, having been well until three weeks previously. Two weeks before admission had pain in the head, and once or twice had vomited. Used to scream at night. Gradually became worse, and at last unconscious, and was said for ten days not to have spoken. On admission she was pallid and emaciated, and the pupils were dilated. Ordered salines and antimony, and cold to her head. Later on strabismus set in; she raved and screamed at night, the pulse being 116, and weak. She sank and died, remaining sensible to the last, July 22nd.

Post-mortem Examination.—Cranium: Sinuses and veins full of blood; arachnoïd opaque here and there, and at base recently-formed fibrine beneath it. Grey matter of brain very vascular. Small yellow scrofulous deposits in the grey matter on the surface of the posterior part of both cerebral hemispheres, specially the right one, the brain-tissue around being softened; in one instance contiguous to a pea-like mass encroaching on the grey matter, but obviously deposited in the pia mater, between two convolutions, were several small extravasations of blood (see B in accompanying Plate); also like deposits at a deeper part. Moreover, scrofulous deposits (varying in size up to that of a pea) existed in the white parts at the posterior portion of the right cerebral hemisphere, breaking up and softening in their interior; there was a large mass of similar deposit in the under part of the right lobe of the cerebellum; lateral ventricles with rather softened walls, and containing turbid fluid. *Thorax:* Miliary scrofulous deposit in, and hepatization of, the lungs. *Abdomen:* Scrofulous deposit in liver and kidneys; cæcum ulcerated. (177.)

Microscopical examination of the cerebral convolutions, which were softened and contained specks of extravasated blood, as above described, showed the blood-vessels to be unusually large, and bulging in places. Many were covered with light-coloured refracting particles of fat, several having them arranged in lines at their edges, others in thick masses where they were bifurcating. The smaller capillaries were more affected than the larger ones. Some of the vessels, in addition to red globules, contained large and small round elongated and light-coloured refractory bodies, without any nuclei. Much granular matter and very small cell-bodies were also found in this softened brain, also very occasional nerve-tubes, and numbers of oval and round doubly-contoured rings, and oval and irregularly-shaped masses of granular matter aggregated together. The microscopical appearances above described are

Fig. 5.

represented in Fig. 5. In the grey matter, which was softened but free from any ecchymosis of blood, a few oval and caudate cells were seen in a granular condition, and occupied with fatty matter (see C in accompanying Plate), and the vessels in these softened parts also contained fatty deposit. The blood in the veins on the surface of the cerebellum and venæ Galeni contained many white corpuscles, and a few large oval cells occupied by a large nucleus and many small refracting particles. In the coagulum of the veins one or two delicately-streaked elongated bodies, *apparently fibrinous casts of small veins*, were seen; these contained fatty globules at their margins. (172.)

CASE XLVIII.—*Scrofulous Deposit at the Base of the Left Cerebral Hemisphere, Softening of Brain, specially of the right Crus Cerebri.*—Thomas F., aged thirty-five, admitted Dec. 6th, 1856. Had had a "fit" two weeks previously and been unconscious for three days. For five months had been weak and emaciated. Of late had been so irrational as to be unable to give an account of himself. No cause for illness could be given. On admission had only a limited amount of intelligence, and there was imperfect paralysis of both hands and feet, the left arm being forcibly flexed at the elbow, the hand touching the shoulder, and immovably fixed there. Left foot also more contracted than the other, but both partly inverted. No deficiency of tactile sensibility of skin. No pains complained of. Tongue dirty; pulse small and quick. Ordered aperients and blister to the neck, and subsequently wine given. Urine became passed unconsciously; alvine evacuations solid and lumpy. No change occurred until just before death (which occurred January 14th, 1857), and then he was suddenly seized with convulsions and coma.

Post-mortem Examination.—Left fore-arm flexed on the arm and the fingers of the hand. Both feet inverted; all limbs rigid. Pupils equal and dilated. *Cranium:* Superficial cranial veins congested. Much fluid beneath arachnoïd membrane and in ventricles. Brain softened, with many bloody puncta on section. Right crus cerebri almost diffluent but not discoloured. Scrofulous deposit connected with the surface of the base of the posterior part of the left cerebral middle cerebral lobe, and also firmly attached to one of the posterior arterial branches. Slight softening of the fornix existed; slight atheroma of vessels at base of brain. *Thorax:* Scrofulous deposit in lungs. *Abdomen:* Kidneys fatty.

Case XLIX. *Scrofulous Deposit in the Left Cerebral Hemisphere. Slight Induration of the Brain.*—Samuel T., aged eleven, admitted March 31st, 1857. Always been delicate, but had been weaker and affected by vomiting for one month. On admission, had been semi-comatose for two or three days. There was much febrile disturbance and convergent strabismus of the right eye. Tongue furred, with large papillæ; abdomen generally tender; screaming violently every few minutes. Ordered ice to the head, blister to the neck, and mercury every three hours. He became better and freer from pain until the 13th, when intense pain, screaming, and great feverishness set in, the mouth being affected by mercury. The evacuations passed involuntarily; he lost flesh rapidly, and the limbs were cold. Later on, convulsive "fits" came on; the trunk became very stiff, and twisted to the left side; pupils became very sluggish and dilated generally, but on one or two occasions very contracted. He became more exhausted, bed sores formed, and he died May 26th.

Post-mortem Examination.—Cranium: Cerebral membranes natural; ventricles very distended with clear fluid, and convolutions slightly flattened; white parts forming the roof of the ventricles rather softened; large mass of scrofulous deposit found in the lower part of the left middle lobe of the brain, causing much projection of the cortex, which was expanded over it, and was redder and firmer than usual. This mass reached almost as high as the lower part of the optic thalamus and corpus striatum. *Thorax:* A few miliary scrofulous deposits found in the lungs. Other organs of body natural. (126.)

Case L. *Scrofulous Deposit beneath the Arachnoïd. Arachnitis.*—Charles F., aged fifty-five, admitted March 4th, 1857, with symptoms of advanced phthisis, having had hæmoptysis, caused, as he thought, by a fall. Went on much the same until a few days before death, when unconsciousness, frequent screaming and moaning, &c., came on. He died April 10th.

Post-mortem Examination.—Cranium: Much fluid existed in the ventricles and beneath the arachnoïd generally; and in the substance of the arachnoïd (specially about optic nerves) were numerous, round, scrofulous masses, many of them surrounded by soft fibrine. Membranes of brain not unusually vascular; no other deposit in brain. *Thorax:* Vomicæ in lungs. (80.)

Case LI. *Scrofulous Deposit in the Cerebellum and Medulla Oblongata.*—Benjamin S., aged six, admitted May 6th, 1857, with slight fever and head-ache, thought to be from an over-dose of laudanum; he made use of purgatives, and got apparently well; and on the 17th, as he was going away from the hospital, he suddenly complained of violent pain in the occiput, and was seized with trembling in all his limbs, and a great want of control over the legs. On being placed in bed, ptosis of the left upper eyelid had come on; both pupils became very dilated, and the tongue protruded to the left. Purges and salines, and a blister to neck resorted to. The ptosis became less, but the want of power in the legs and the trembling remained the same, until the 30th, when almost unceasing hiccough came on, and his appetite quite failed him; urine was free from albumen: the gums were made tender by mercury, and the symptoms became more favourable; later on they became again aggravated; swallowing gave pain, and dysphagia gradually increased, so that he could swallow nothing but wine, and he sank and died on the 31st.

Post-mortem Examination.—Cranium: Cerebral convolutions flattened; much clear fluid in the ventricles; fornix softened; strumous deposit (size of walnut) in the substance of the right lobe of the cerebellum, and another of smaller size in the medulla oblongata, the brain tissue around them being healthy. *Thorax:* Pleural adhesions full of scrofulous deposit; vomicæ in, and hepatization of, lungs; the organs of the body natural. (189.)

CASE LII. *Scrofulous Mass of Deposit in the Cerebellum. Brain Softened.*—John R., aged four, admitted June 17th, 1857; was born in Gibraltar, and one month after coming to England (which was six months previous to admission) began "to pine away and be fretful." Three months later epistaxis came on, and cough; then the abdomen began to swell, and pain in head came on. When admitted, he was anæmic; pulse very rapid and thready; tongue coated; abdomen protuberant; liver enlarged; respiration 50 per minute; strabismus with both eyes. Treated by aperients, nutritious food, and afterwards by gallic acid; later still, by acetate of lead, as the epistaxis became frequent. Subsequently, the strabismus was confined to the right eye; both pupils became dilated, acting to light. The epistaxis required plugging of the nostrils; slight albumen found in the urine. Slight convulsions came on, and eventually coma before death, which occurred August 11th.

Post-mortem Examination.—Cranium: Ventricles distended with fluid; central parts of brain very softened indeed; scrofulous mass (size of large pea) quite superficial, at the under surface of the right lobe of the cerebellum. *Thorax:* Scrofulous deposit in lungs and bronchial glands. *Abdomen:* Like deposit in liver and spleen. (193.)

CASE LIII. *Scrofulous Deposits in the Right Lobe of the Cerebellum, &c.*—Francis D., aged thirty-six, admitted July 23rd, 1857, having been ailing six weeks, but worse one week, and having been brought home in a state of unconsciousness following delirium. On admission he breathed pretty easily; the pulse was quick, though rather oppressed; sores existed about the mouth; no anxiety of face, and no abdominal tenderness existed. He lay constantly in the same position moaning and groaning. He took but little nourishment, skin became cool, pulse feeble; rattling in throat came on, and he died July 25th.

Post-mortem Examination.—Cranium: Meningeal vessels very congested, and sinuses containing very dark clots; much opaque deposit between convolutions. At one point above the right cerebral hemisphere was a light yellow scrofulous deposit (size of large pin's head). Cortex of brain darker than usual; ventricles quite distended with clear serum: their septum broken down; central parts of brain and corpora striata, and optic thalami much softened; arachnoïd at base of brain thickened and opaque; two scrofulous deposits found in *right* cerebellar hemisphere, and also small similar deposits in pia mater covering the same lobe. (108.)

CASE LIV. *Scrofulous Deposit within the Cranium.*—Elizabeth S., aged nineteen, whom I had seen on several occasions in her native village in Hertfordshire, strumous-looking, and of a delicate family. Was admitted into the hospital May, 1858, with general feverishness, and swelling with tenderness at the root of the nose. Both pupils were very dilated, and quite inactive, excepting that she could distinguish light from darkness with the RIGHT eye, was quite blind, and had lost all power of smell. No want of equilibrium in the facial muscles. There was greatly-increased sensibility to touch, pricking, and pinching, and tickling of the skin covering whole of the body, but the surface of the LEFT side of the face and arm appeared to be more sensitive than the same parts on the opposite side. No other special symptom. After she had been in hospital a week or two, vomiting, with epileptiform attacks, came on, and the pupil of left eye became larger than the other, but both much dilated. *When asleep, both pupils were contracted.* There was some starting during sleep, and slight exclamation at times, as if pain was felt. It was said that she had had two or three attacks of difficulty in articulation, lasting ten or fifteen minutes, but no dysphagia, and no symptoms of paralysis of any outer parts. At times, also, it was noticed that she wandered slightly in mind, and was very stupid in manner; otherwise very intelligent and cheerful. Temperature of the skin of the arms found to be equal (98° Fahr.). By the 8th of June, involuntary passage of evacuations had come on, and the conjunctivæ of both eyes were very vascular, having their sensibility diminished. There was also difficulty in opening the mouth, and in protruding tongue, which was dry. The corneæ, especially the *left* one, then began to slough, and the face to become very flushed. Both pupils were then contracted; both eyeballs afterwards began to move about vacantly in all directions, and there was slight strabismus, but it was difficult to find out which eye was affected. The sensibility of skin of legs became so increased, that the bed-clothes were with difficulty borne. Two days later she became very noisy and restless; there was constant fumbling with fingers, and low, muttering delirium. Much rolling and oscillation of eyeballs; conjunctivæ covered by muco-purulent fluid. Pulse very feeble and weak; evacuations as before; catheter used to draw off urine. An abscess was found at bottom of back, and a large quantity of pus was discharged by bowel, thought by the nurse to come from the abscess. Fæces very offensive. At this time, the temperature of skin of face was equal on both sides (rather more than $98\frac{1}{2}$°). On the 12th of June she was quite unconscious. Much purulent fluid bathing the eyes, and right pupil more dilated than the left, and often and quickly altering in size. Temperature of both cheeks $92\frac{1}{2}$°. She sank and died, no convulsive movement taking place, on the 14th. Unfortunately, post-mortem examination of the head was not allowed; but from her symptoms, family history, &c., it may be assumed as probable that some scrofulous deposit had been formed in connexion with the brain or its membranes, probably associated eventually with effusion of fluid and fibrine within the cranium.

CASE LV. *Scrofulous Deposit in the Corpus Striatum. Arachnitis.*—Richard C., aged twenty-nine, admitted August 4th, 1858, with continued fever, of twelve days' standing; had been subject to head-ache, and had had several fits, and for several nights been delirious. On admission, pulse was feeble, tongue dry and black, covered with sordes. No petechiæ on the body. Ordered salines, and ammonia, and port wine, and an aperient. The next day was improved, but on the following one seized with delirium, and he sank and died on the 8th.

Post-mortem Examination.—Cranium: Skull thick and heavy, with but little diploë. Ventricles distended with fluid; septum and fornix softened; scrofulous deposit in the anterior part of corpus striatum (size of a pea) in a distinct capsule, consisting, *as seen by the microscope*, of imperfectly formed areolar tissue, with elements of scrofulous deposit; brain structure around *unaltered;*

much gelatinous fibrinous material in the sub-arachnoïd tissues at the base of the brain; and in places pia mater and arachnoïd very adherent to brain. *Thorax:* Vomicæ in lungs. *Abdomen:* Ulceration of cæcum and its appendix. (209.)

CASE LVI. *Scrofulous Deposit in several parts of the Brain.*—Joel W., aged six, admitted Dec. 9th, 1858. A scrofulous-looking child, who had been ailing two months, complaining of severe pain in the fore-head, and always feeling chilly. At times he screamed from pain; pulse languid; skin cold and clammy; bowels costive. Aperients given, and he went on well until the 21st, when much pain returned in the head; febrile symptoms set in; the brow became corrugated, and convergent strabismus of the *left* eye came on. He varied daily, and at times pain prevented sleep. Iodide of potassium, with nitric æther and salines ordered, and subsequently calomel and Dover's powder. After much pain he died on the 18th.

Post-mortem Examination.—Cranium: Superficial parts of both cerebral hemispheres, and lateral parts of cerebellar hemispheres, covered with small scrofulous masses; similar masses (varying from size of pin's-head to that of a pea) scattered about other parts of brain, a large one being in the right optic thalamus, and several in the cerebellum. *Thorax:* Scrofulous deposits and vomicæ in lungs. *Abdomen:* Like deposit in the cortex of the kidneys, and in one lumbar gland.

CASE LVII. *Scrofulous Deposit in the Right Lobe of Cerebellum and in Right Cerebral Hemisphere: Old Blood-clots in the latter.*—Sarah A., aged fifty-seven, admitted July 6th, 1859. Had had an "apoplectic fit" many years previously, followed by paralysis of the limbs on the *right* side. She regained some power, and chiefly in the leg. Eight months before admission pain and swelling of the left ankle came on, and ulcers formed there. On admission she was wasted by the discharge. Amputation was performed, owing to caries of the foot. The stump went on well for a time, but hæmorrhage came on, and then phagedæna. All went on well for a time, but she became feeble; she sank and died September 1st.

Post-mortem Examination.—Cranium: Rounded mass of scrofulous deposit (size of a nut) at lower part of right lobe of cerebellum, close to the surface. The remains of two old blood-clots existed in the convolutions of the right cerebral hemisphere bounding the great median fissure. They had lost colour, and were mixed with small portions of yellow scrofulous substance; surrounding brain softened and œdematous. (209.)

CASE LVIII. *Scrofulous Deposits in the Sub-arachnoïd Tissues. Arachnitis, &c.*—Edward R., aged twenty-eight, a very intemperate man, admitted April 18th, 1860. Was unable to give an account of himself; but it appeared that he had had much pain in the head, and aching of the thighs, after a week's debauch, that the bowels had been confined for five days, and that there had been vomiting of black and yellow material. On the night before admission he had fallen down in an attack of giddiness, and when he came to the hospital there was great pain in the head, the pulse was rapid, tongue flabby and coated; there was double vision, and the speech and locomotive powers were like those of an intoxicated man. The bladder, relieved by catheter, was found to be distended with eighty ounces of urine, which was healthy. Ordered aperients and enemata, and ammonia. On the day after admission, having passed a noisy, restless night, his ideas were very incoherent, and evacuations voided involuntarily. Deglutition was still good; but articulation less clear, and pupils of eyes more dilated. In spite of counter-irritation to the neck he became unconscious; the pupils became fixed; the expiration noisy and grunting; the legs and arms affected by tonic spasms, the arms being occasionally relaxed.

Later on he became again more conscious, and would even protrude the tongue, the spasm and dysphagia being diminished, and the pupils more active. He soon, however, got worse, and without any form of paralysis, except partial ptosis, he died on the 22nd.

Post-mortem Examination.—Cranium: Lateral ventricles contained much clear fluid, especially the right one, and the fornix was rather softened. Much recently-formed fibrine in sub-arachnoïd spaces at base of brain, and covering the superior vermiform process of the cerebellum. Numbers of miliary scrofulous deposits also in sub-arachnoïd tissues. *Spinal cord:* Natural. *Abdomen:* Scrofulous deposit in lungs.

Case LIX. *Scrofulous Deposits connected with the Lining Membrane of Cerebral Ventricles, &c.*—Alfred C., aged seven, admitted April 25th, 1860, having a strumous, under-fed look, and complaining of stiffness of the neck, and pain in the belly and at the back of the head. He gradually lost the use of the *left* arm, and later on, the neck became so stiff that he could not turn the head without also turning the body. He had no power to move the elbow and shoulder of the affected arm, but could move the fingers, the muscles of the limb being quite relaxed. The legs were unaffected. Treated with cod-liver oil and syrup of iodide of iron. He had been very drowsy for several days when he suddenly lost the sight to a great extent, though not completely; the pain in the head became extreme, and unconsciousness came on. Blistering the neck and mercury were resorted to. The pupils became very dilated and inactive, and the conjunctivæ became vascular. There was no facial paralysis or vomiting, but constipation was very troublesome. Sordes of the mouth and rapidity of pulse came on, and he sank and died May 6th.

Post-mortem Examination.—Cranium: Cerebral veins very full. Miliary scrofulous deposits found in the lining membrane of the lateral ventricles, which were very full of serum. Much recently-formed fibrine beneath the arachnoïd at the base of brain. Brain substance natural. *Thorax:* Vomicæ in lungs. *Abdomen:* Ulceration of colon. (135.)

Case LX. *Scrofulous Deposit in the Right Cerebellar Hemisphere, &c.*—William B., aged fourteen, admitted Jan. 26th, 1861. Supposed to have been well until ten days previously, when he was suddenly attacked with vomiting, followed in three or four days by convulsions and then by coma. Never known to have had any pain. Admitted with flushed face, skin hot. Pulse 112, small and weak. Complete ptosis of the right upper eyelid; left pupil very dilated, and insensible to light; divergent strabismus of right eye. On the *left* side there was partial strabismus and the conjunctiva of the eye was vascular, and covered with mucus; but there was no strabismus, and the pupil was natural. Left side of face partially paralysed, as also the left arm. In the right arm the muscles retained their contractility; sensibility of the skin absent in both arms, but remaining in both legs, less so, however, in the left than the right one. Respiration hurried. Ordered wine, counter-irritation to the neck, and an enema. The pulse became very rapid and feeble, and without any fresh symptoms he died January 30th.

Post-mortem Examination.—Cranium: Brain congested; slight amount of recent fibrine in sub-arachnoïd spaces at the base and other parts of the cerebellum, and about the roots of the third pair of cranial nerves. Large-sized mass of scrofulous deposit in the right hemisphere of the cerebellum, close to the commencement of the middle crus cerebelli, and at the root of the so-called "arbor vitæ." Other parts of brain natural. *Thorax:* Old cretaceous deposit in the lung, with old pleural adhesion. *Abdomen:* Right kidney a mere bag of scrofulous deposit, and its ureter full of the same material. Other organs natural. (33.)

CASE LXI. *Scrofulous Deposits in the Sub-arachnoïd Tissues, &c.*—Henry H. H., aged eighteen, admitted Feb. 20th, 1861. Was in good health until five days previously, when he had a "fit" before rising in the morning, lasting a quarter of an hour. Afterwards giddiness and pain in the head existed, and on the third day he fell down insensible, and so remained twenty minutes. On admission he was pale and sickly, and he said at times he had numbness of the *left* side. There was no apparent paralysis of any part. Pulse feeble. Urine free from albumen. He subsequently often complained of numbness at the *left* side of the face, and of giddiness. He one day became delirious and groaned much, complaining of the head, and on the following day was very stupefied. Fever set in, and he was ordered salines and calomel in frequent doses, with cold lotion to the head. Partial coma supervened, and afterwards hiccup, and involuntary passage of evacuations. He had some kind of a "fit," with stiffening and distortion of the limbs, and gradually sank and died March 20th.

Post-mortem Examination.—Cranium: Small miliary tubercles in the sub-arachnoïd spaces of both cerebral hemispheres, chiefly on the right side, and on the centre of the outer side of the hemisphere where the membranes were closely united to each other. At base no morbid appearances. Brain substance natural; but much ventricular fluid existed. *Thorax:* A few quiescent tubercles in lungs, which were congested. *Abdomen:* Crude tubercle in spleen; other organs natural. (80.)

CASE LXII. *Scrofulous Deposit in the Right Lobe of the Cerebellum. Extensive Softening of the same Lobe, as also of the Left Crus Cerebelli.*—Catherine A., aged nineteen, single, a dressmaker, was admitted into University College Hospital, May 16th, 1861. Father and mother, one brother, and one sister, had all died of consumption. She had had good general health until lately, and had regularly worked until nine or ten at night at her business, in an airy but crowded room. She had spat blood some time previously, but never had much cough; never had "fits" of any kind. Illness commenced about three months ago, as a general weakness and loss of power in the limbs, without any pain. She seemed only about "half-witted," and had convergent strabismus of the right eye, which she stated had been "growing very weak" for the last week. Pupils equal, rather dilated, acting well, but sight very bad, not being able to distinguish large letters on bed-card. Had vomited a good deal. Taste, and smell, and hearing natural. Catamenia absent three months. Ordered small doses of the bichloride of mercury thrice a-day. Two days after admission, cutaneous sensibility found to be diminished on left side; could not be maintained in sitting position; squeezing power very feeble in both hands, but equal, as far as could be judged. No spinal curvature nor tenderness under percussion. Evacuations passed involuntarily, during sleep, giving warning in sufficient time when the patient was awake. Eyes examined by Mr. Wharton Jones with ophthalmoscope, &c.; nothing discovered except congested state of retina. Later on, eyes appeared more thoroughly amaurotic; sight worse; could only distinguish light from darkness; prominence of eyeballs very considerable; size of pupils as before. No pain of head; blisters to temples, and the endermic use of strychnia resorted to by means of the blistered surface ($\frac{1}{30}$th gr.). At the beginning of June the eyes were more staring; complained of pain in teeth; tongue rather reddish, with brownish fur at back; gums turgid, with red marginal line; no distinct fetor (mercurial). On June 4th greater heaviness of manner had come on; the mercury was omitted; articulation less ready; also pain at top of head came on. No twitching of the limbs; left leg appeared to have more power than the right, but could not be sustained elevated very long. The mercury was resumed; the head-ache was relieved, but the squinting increased. She died June 8th, asphyxiated.

Post-mortem Examination.—Cranium: Skull very soft, and thicker than usual, and inner surface very vascular, with well-marked prominences. Scalp particularly free from blood; exceedingly fine general vivid injection of dura mater, which was smooth and natural, excepting that it was decidedly thicker than natural; and this thickening seems independent of vascularization, and certainly not in arachnoïd. Cerebral surface of arachnoïd remarkably dry; pia mater and arachnoïd viscera quite natural. On section, the central white substance of brain was of a dull, opaque white colour, and certainly more deficient than usual in red points. Different parts of the cerebrum paler than usual; lateral ventricle found to be greatly distended with clear fluid, and their walls soft and "pappy." Olfactory nerves perfectly healthy. The *Cerebellum* was much softened, especially the right lateral lobe, which was found to have broken into pap around a morbid mass, which was itself exceedingly firm, about the size of a large hazel-nut; cutting crisply, and presenting, on section, a semitransparent ground, distinctly vascular lineally, and also presenting blood-points. In this manner, numerous small, opaque, pale greenish-yellow spots stood out in strong relief, having the appearance (to the naked eye) of tubercle. The softening was so complete that the cerebellar substance in the neighbourhood of the tumour could be poured away almost like cream; in some spots, softening very sharply limited, the transition from pulpiness to moderate firmness being quite sudden. The middle lobe apparently unaffected; left lateral lobe in its outer two-thirds also apparently quite healthy, but at its inner third it was pulpy, soft, and of a pale yellow tint; no tumour was connected therewith. Crus cerebelli on the left side was involved in the softening connected with the tumour. Pons Varolii natural, still a little diminished in general consisteuce. Other parts of body not examined.

For the opportunity of describing this case, I am indebted to Mr. Beramjeh Colah, late a student in University College Hospital, who watched the case in that hospital under the care of Dr. Walshe, who has kindly consented to its appearance in this place.

Case LXIII. *Scrofulous Deposit in the Right Lobe of the Cerebellum. Phthisis. Scrofulous Deposit in Liver and Uterus, &c.*—Sarah W., aged sixteen, admitted May 19, 1861. Died May 27. No history, except that the girl had never menstruated.

Post-mortem Examination.—Cranium: Pia mater congested; cerebral convolutions flattened; the medullary part of the brain, forming the anterior portion of the roof of the left lateral ventricle, was much softened; arachnoïd at base of brain thickened and opaque. Scrofulous mass of deposit (size of a hazelnut) was found in the centre of the right lobe of the cerebellum. Much limpid fluid existed in the ventricles. *Thorax:* Scrofulous deposit existed in the lungs. *Abdomen:* Scrofulous deposits in liver and cavity of the uterus and Fallopian tubes.[1]

Case LXIV. *Two Masses of Scrofulous Deposit in the Substance of the Cerebellum. Phthisis.*—Anne B., aged eighteen, admitted July 7, 1861; and died July 17. No history.

Post-mortem Examination.—Cranium: Lateral ventricle with much serum; their walls softened, and septum tender, pulpy; arachnoïd at base of cerebellum very opaque; two scrofulous masses (one the size of a marble, and the other size of a pea) in the cerebellum, the latter being quite superficial. *Thorax:* Lungs studded with scrofulous tubercles.[2]

[1] See Hospital Post-mortem Book, 1842. No 96.
[2] Ibid. No. 128.

CASE LXV. *Scrofulous Deposit in the Cerebral Convolutions. Arachnitis. Softening of the Fornix and Crura Cerebri, &c.*—Mary R., aged fourteen, a strumous-looking child, was admitted January 27th, 1862. Ten days before, she began to be drowsy and shivering, and to have pain in the head, and was thought to have typhus fever; three or four days later, she fell down and struck her forehead, and on the following day her manner was strange, and she became partially unconscious. On admission she was only partially conscious. Respiration was occasionally interrupted by sighs; skin warm and moist; pulse 70; eyes rolling vacantly when uncovered; pupils dilated and inactive; dysphagia existed, and she could not protrude the tongue. Soon after admission the pulse rose to 130, and venæsection to ℥xvj. was performed, and mercury and purgatives given. On the following day the pulse was 150. Symptoms afterwards improved for a time, and she became more sensible; the tongue was protruded, but was dry and baked. Subsequently the pupils became dilated and insensible. In spite of treatment she gradually sank, and died on the 29th.

Post-mortem Examination.—Cranium: Brain very congested; scrofulous deposit in the convolutions (one inch in thickness) at the vertex of the right cerebral hemisphere, near the longitudinal sinus; ventricles rather dilated by turbid fluid; much recently-formed fibrine in the arachnoïd cavity at the base of the brain, extending from the optic commissure to the pons Varolii, and embedding the third pair of nerves; fornix and crura cerebri softened. *Thorax:* Scrofulous deposit in bronchial glands and lungs. *Abdomen:* Similar deposit in spleen, liver, and kidneys.

CASE LXVI. *Scrofulous Deposit in several parts of the Cerebral Hemispheres. Softening of the Pons Varolii, &c.*—Anne T., aged twenty-four, admitted April 14th, 1862; having been delicate since her confinement five weeks previously, with pain in the back and head. On admission was feverish, complaining of pain all over the head, and physical signs of the early state of phthisis existed. Ordered salines, with nitre and opiates, and beef-tea. Two days later pain in the head was worse, and drowsiness had come on; pupils dilated. Constant talking succeeded, and the evacuations were passed involuntarily. After a few days, some sort of a "fit" occurred, and she lay insensible and constantly muttering. Gradually sank, and died April 22nd.

Post-mortem Examination.—Cranium: Brain generally vascular; ventricles full of turbid fluid; pons Varolii and medulla oblongata bathed in greenish soft fibrine, which embedded the cranial nerves from the second to the seventh; miliary scrofulous deposits in the pia mater at the base of the brain, and in the fissure between the hemispheres. A mass of crude scrofulous tubercle found in the lower part of the posterior lobe of the left cerebral hemisphere, another in the corpus striatum, and two more in the anterior lobe of the right cerebral hemisphere. Patches of ecchymosis on the face of pons Varolii and crura cerebri, and slight superficial softening of pons Varolii, existed. *Thorax:* Scrofulous miliary deposits in lungs. *Abdomen:* Like deposits in kidneys and peritoneum. (109.)

CASE LXVII. *Scrofulous Deposits connected with the Arachnoïd Membrane. Caries of the Lumbar Vertebræ.*—Jane A., aged fifty, admitted September 10th, 1862, with caries of the spine of one year's standing, and with angular curvature at the middle of the dorsal region. There was much pain on pressing the part, a fluctuating tumour in the left groin, and a fulness of the left iliac region. Went on well until November 1st, when sickness and great pain at the chest came on, and this continued without intermission, and in spite of treatment, for three days, when she died November 4th.

Post-mortem Examination.—Cranium: Veins of the brain and its membranes congested; arachnoïd at the base slightly thickened and studded with minute scrofulous tubercles. *Thorax:* Old scrofulous deposit at the apices of the lungs. The abscess in the groin before spoken of was traced to the first and second lumbar vertebræ, which were carious. (297.)

Case LXVIII. *Scrofulous Deposits in both Cerebral Hemispheres and attached to Dura Mater. Brain Softened.*—Honora Q., aged four, admitted September 29th, 1862, having had hooping-cough two years previously, and having squinted ever since. One month before admission she had an attack of "convulsions," and since then she had lost spirits and appetite, and been weak and ailing, and latterly had vomited much. Was admitted comatose, with the legs flexed on to the belly, and with febrile symptoms; ordered salines and aperients; ascarides with mucus were passed. For a time only the pulse abated; coma became deeper; frequent convulsions came on, with complete blindness. Opisthotonos supervened, and slight convulsive movement of the arms. Loud râles became audible over the whole of the chest, and she died October 6th.

Post-mortem Examination.—Thorax: Scrofulous deposits in lungs; pericardial adhesions. *Abdomen:* Scrofulous deposit in the liver and mesenteric glands. *Cranium:* Anterior fontanelle very large; posterior one ossified. Three scrofulous deposits found in the brain (size of peas), one in the left and two in the right cerebral hemispheres; brain pale and softened, specially the fornix; scrofulous mass adherent to the dura mater on the right side of the cranium, pressing upon the cerebellum, below the torcular Herophili, and close to the occipital foramen. (273.)

Case LIX. *Scrofulous Deposits in the Sub-arachnoïd Tissues. Arachnitis. Red Softening of Cerebral Convolutions. Softening of Spinal Chord.*—John D., aged thirty-three, admitted October 11th, 1862, owing to strumous disease of the ankle. The leg was amputated, and the stump healed well, and he was about to be discharged, when he fell into a comatose state, with dilated pupils and quick bounding pulse, followed by stertorous breathing; he died the following morning, January 1st, 1863.

Post-mortem Examination.—Cranium: Superficial cerebral veins very full; much recent fibrin in the arachnoïd spaces at the base of the brain and along the superior longitudinal sinus on both sides; in addition to this a number of miliary scrofulous deposits (size of mustard-seed) were met with beneath the pia mater, corresponding in position to the fibrin in the arachnoïd cavity. Grey matter of brain very dark, and white parts full of "puncta." Single patch of red softening seen, close to the surface at the upper and outer part of the right cerebral hemisphere. Fornix and neighbouring parts very softened, and the ventricles full of turbid fluid. *Spinal Cord:* Softening of the cord existed opposite the eleventh dorsal vertebra for half an inch, and throughout its whole thickness; spinal membranes natural. *Thorax:* Old pleuritic adhesions and scrofulous deposit in lung existed. *Abdomen:* Front of the bodies of several dorsal vertebræ bathed in pus and denuded; caries of the tenth and eleventh vertebræ. (1.)

Case LXX. *Scrofulous Deposits in the Cerebellum. Arachnitis. Softening of Walls of Ventricles.*—Edwin S., aged forty, admitted April 8th, 1863, for stricture of the urethra of several years' standing, and with well-marked phthisis. The urine often contained blood, and always albumen, and soon became ammoniacal. On the 22nd he became very delirious, and afterwards comatose: the breathing became oppressed; redness and flushing of the face, and afterwards lividity came on, and he died from apnœa on the 25th.

Post-mortem Examination.—Cranium: Lateral ventricles very distended with turbid fluid, and their walls softened, as also the fornix; the septum was cribriform; masses of scrofulous deposit were found in each lobe of the cerebellum; effused yellow fibrine existed in the sub-arachnoïd tissues at base of brain. *Thorax:* Scrofulous deposits in lungs and beneath pleuræ. *Abdomen:* Similar deposits in kidneys, the pelvis of one being ulcerated. (110.)

CASE LXXI. *Scrofulous Deposits in various parts of the Brain. Arachnitis.* —Thomas M., aged eight, admitted August 26th, 1863, for disease of the shoulder-joint. In November, general febrile symptoms set in, and he quickly became comatose. On the 14th, the pupils of the eyes were unequal in size, and a blister was applied to the neck. Coma continued, and he died Nov. 19th.

Post-mortem Examination.—Cranium: Vessels of the dura mater and surface of the brain very congested; ventricles distended with turbid fluid and their septum perforated; fornix and septum softened; much recently-formed fibrine in the sub-arachnoïd tissues at base of brain; minute scrofulous deposit found beneath the pia mater covering several parts of the brain, and several rounded scrofulous masses in the brain—viz., in the cerebellum, pons Varolii, and in the cerebral hemispheres, particularly at the base. Of these, the largest was of the size of a pea. *Thorax:* Scrofulous deposit in lungs. *Abdomen:* Similar deposit in spleen. Abscess found in the deltoïd muscle of the right shoulder-joint; the joint being natural.

CASE LXXII. *Softened Scrofulous Deposit in the Substance of the Brain. Softening of the Brain. Effusion of Fluid within the Cerebral Ventricles. Scrofulous Deposit within the Pericardium and in Lungs.*—Annie B., aged three years, in November, 1863, was brought for advice, suffering from severe dyspnœa and cough. The countenance was flushed, skin hot, pulse 120, tongue foul, respirations 30 in the minute. The mother stated that the child had caught a chill a few days previously, and that she had been rapidly getting worse; she also stated that the respiration had always been most hurried since the child was three months old, when it suffered from what she called asthma; but, except the hurried respiration, the child had been very healthy up to the present time. On listening to the chest, loud blowing respiration was heard in the apex and middle of the right lung, and in portions no respiratory murmur was audible. The expiratory murmur was exceedingly loud throughout the whole of the left lung, and fine crepitant râles were audible throughout the structure of both lungs. The cardiac sounds were exceedingly muffled, and its action most irregular. Purgative medicine was administered, with ammoniated salines and small quantities of antimony; but it was not until nearly two months had elapsed that the acute bronchial symptoms had subsided. During this period, the child's features at different periods became intensely blue, which led to the suspicion that the foramen ovale was not entirely closed. After the bronchial symptoms had subsided, the hurried respiration still continued, being 30 in the minute. In February, when the child was again seen, the respiration remained the same, the heart's action was still very irregular, and the cardiac sounds were still very muffled. In portions of the right lung no breathing could be heard. As the child was much emaciated, cod-liver oil was ordered, the effect of which was most marked, as the child rapidly gained flesh. In March, on one occasion, some vomiting came on, but ceased on discontinuing the cod-liver oil and the exhibition of a mercurial purge; but on the following morning the child was almost comatose; the eyes were staring, and the pupils insensible to light. Calomel, in grain doses, and salines were ordered, and the bowels were freely acted on. During the night most severe convulsions came on, accompanied with opisthotonos, and the lower jaw was firmly locked. The calomel was still continued, and a blister was ordered to the back of the neck, but the child sank during the night.

Post-mortem Examination.—The body was much emaciated. *Thorax:* The right lung was full of large tubercular masses, and portions of it were entirely collapsed; the left lung was also full of large tubercular masses. The bronchial glands were also very much enlarged, pressing on the tubes prior to their entrance into the substance of the lung. The pericardium was firmly adherent, and studded throughout with small tubercles. *Cranium:* The convolutions were somewhat flattened, and both ventricles contained a large quantity of clear fluid. In the right cerebral hemisphere the remains of a softened scrofulous tubercle were visible.

[For the opportunity of relating this case, I have to thank my friend, E. Venning, Esq., assistant-surgeon to the 1st Life Guards.]

Case LXXIII. *Scrofulous Deposit in the Left Lobe of the Cerebellum.*—The patient was a child who died from hydrocephalus; but I have no further history of the case.

Post-mortem Examination.—A scrofulous tumour of the size of a small nut was found occupying the surface of the posterior part of the left lobe of the cerebellum. *On Microscopical Examination.*—After maceration in spirit for many years, the tumour presented the following histological appearance:—It showed a large amount of clear, refracting granular matter, and great numbers of small cells, chiefly of a rounded or irregularly oval form, though some were more elongated. These cells contained much dark granular matter, but nothing like distinct nuclei. The addition of acetic acid rendered the cells larger, but did not bring any nuclei to light.[1]

Case LXXIV. *Scrofulous Deposit in Cerebellum.*—The patient was a child who had been subject to epileptic attacks; beyond this, nothing was known of her history.

Post-mortem Examination.—The scrofulous mass, of the size of a large hazel nut, was situated in the upper part of the right lobe of the cerebellum, and contained a certain amount of *calcareous* matter. *On Microscopical Examination* very much the same appearances were met with as in the case above, No. LXXIII.[2]

Case LXXV. *Scrofulous Deposit in the Cerebellum.*—The patient was a child, three years of age, who had fallen into a cachectic state, owing apparently to living in an unhealthy district. He was recovering, by means of change of air, &c., when he returned to the same locality, and shortly after this he became suddenly affected with symptoms of hydrocephalus, of which he died.

Post-mortem Examination.—The cerebellum was found to contain a scrofulous tumour in its inferior vermiform process, the surrounding brain substance being unaffected. Softening of the fornix and of the walls of the ventricles existed, and the so-called "exudation corpuscles" were found coating the bloodvessels of these parts, and of the cerebral hemispheres.[3]

[1] This preparation exists in the St. George's Hospital Museum as No. 32, Series VIII.

[2] Ibid. No. 33, Series VIII.

[3] Ibid. Series VIII., No. 35.

ART. III.

On Thoracic Aneurysms and Thoracic Tumours, with Cases. By A. T. H. WATERS, M.D., Physician to the Liverpool Northern Hospital.

THERE are few diseases more interesting to the practical physician than thoracic aneurysms and other forms of thoracic tumours. The insidious character of their origin, the frequent obscurity of their symptoms, the occasional rapidity of their progress, and their tendency to a fatal issue, render aneurysms of the great vessels of the chest a study of more than ordinary importance. That their diagnosis at an early stage, and the discrimination of them from other forms of thoracic tumours, as well as from certain affections of the heart, are often attended with great difficulty, no one will deny. It is, however, in the direction of early diagnosis that our efforts should be made, for on this, the value of our treatment, and our hope of prolonging life, must mainly depend.

During the past few years, I have had under my care several cases which will serve to illustrate the symptoms which characterize the above diseases, their progress, and method of termination, as well as the more or less permanent relief which sometimes occurs in them from the use of remedial measures. To some of these cases I propose to refer.

CASE I. *Aneurysm of the Arch of the Aorta. Sudden Death from Rupture of the Aneurysm into the Left Lung.*—William T., forty-eight years of age, a sailor, was admitted into the Northern Hospital under my care on the 6th of May, 1861. He gave the following history:—He had followed his occupation on board ship up to ten days before his admission. For about a week he had had a cough, which was unattended with expectoration. For two or three nights he had been unable to lie down, and the day before he came to the hospital he had had a fit of dyspnœa which lasted for about half an hour. He said he had never felt any throbbing in his chest, nor any other unpleasant symptoms except those just mentioned. I saw him for the first time on the 8th of May, and just as I was about to make a physical examination of the chest, he was suddenly seized with a violent attack of dyspnœa. The paroxysm resembled in every respect a severe asthmatic seizure. The surface of the body became livid, and was covered with a profuse clammy perspiration. These symptoms lasted for nearly a quarter of an hour, when chloroform was cautiously administered by inhalation. After a short time this gave relief, the spasm passed off, and the breathing became natural again.

At a subsequent visit, I made a careful examination of the patient, under the impression that there must be some thoracic tumour. He had had a slight return of the dyspnœa, and had found relief from smoking stramonium. He complained of a feeling of weight in the chest, opposite the upper part of the sternum, and had a constant ringing cough.

There was the usual amount of dulness on percussion in the cardiac region, with dulness opposite the upper half of the sternum, and in the first, second, and third intercostal spaces for about $2\frac{1}{2}$ inches to the left of the median line. A distinct impulse was felt in the second and third left intercostal spaces. The heart-sounds were normal, and no bruit was audible over the seat of impulse or of dulness. The right brachial artery was hard, and felt under the finger like a firm cord. No difference was noted in the pulse of the two sides.

On the 20th of May, a fortnight after admission, I made the following note :—"He appears to be improving ; complains of no pain, nor of any unusual feeling about the chest, but he has dyspnœa on exertion. He is unable to lie down, and uses a bed-rest." On the 28th he had so far improved as to be able to lie down without the bed-rest. He continued without much change, either in the general symptoms or physical signs, up to the 8th of June, when he had slight hæmoptysis. On the 17th the hæmoptysis returned to a greater extent, and on the 20th, at one o'clock A.M. the house-surgeon was called to him, and found him dead. He had suddenly thrown up a large quantity of blood, and died immediately.

A *Post-mortem Examination* was made the following day. On opening the thorax, the cause of the dulness and pulsation was apparent : a tumour occupied the situation of the dulness, and on examination it was found to be an aneurysm connected with the ascending portion of the arch of the aorta. The tumour was about the size of an orange, and had pushed its way upwards, and to the left, into the apex of the left lung, in which it was, in part, embedded. The aneurysm was of the dissecting kind; it had separated a portion, about an inch and a half in length, of the inner coats of the artery from the external coat, which latter formed the covering of the aneurysm. The cavity of the aneurysm had some firm fibrinous layers in it, and very little soft clot. An opening was found in its upper part, which led into the substance of the left lung. The left lung was full of blood; the right lung also contained blood. The heart was very pale and soft, apparently fatty; it was not examined under the microscope.

Remarks.—The most important points for reference in this case are, 1st, the insidious manner in which the disease crept on, and the proportions it assumed, before it gave rise to symptoms which attracted the attention of the patient. That it had existed for a longer period than ten days before the patient came to the hospital, there can be no doubt, and in all probability the tumour had developed itself to a considerable extent, and was making its way into the substance of the left lung, when the first paroxysm of dyspnœa occurred.

2nd. I would refer to the character of the first important symptom —viz., the asthmatic seizure—a reflex spasm of the whole of the bronchial tubes, set up, no doubt, by the pressure of the tumour on the pneumogastric nerve.

Lastly, I would allude to the occurrence of hæmoptysis on two occasions preceding the fatal one. This is almost always an alarming symptom, and if, when there is a supposition of aneurysm, it occurs in more than a very small degree, it should put us on our guard as to the probability of an early fatal issue. It is quite true, however, that in some cases of aneurysm, hæmorrhage, even of a profuse kind, has taken place some weeks, and even months, before death has occurred. In such case, the opening which has been made has been plugged up by laminæ of fibrine, or coagulated blood.

CASE II. *Aneurysm of the Arch of the Aorta. Rupture into the Trachea. Sudden Death from Hæmorrhage.*—Philip R., thirty-eight years of age, a Frenchman, by occupation a sailor, was admitted to the Liverpool Northern Hospital, under my care, on the 22nd December, 1861. He gave the following history:—His health had been good, he said, up to the previous July—viz., about six months before admission. On the 4th of that month he left this country for St. Louis. Whilst at sea he had dyspnœa and pain in the chest. When he reached a warmer climate his symptoms were greatly relieved; in fact, he felt but little of his ailment. After staying at St. Louis for eight weeks, he returned home, and as he approached this country his symptoms reappeared. He reached Liverpool on the 12th November, and a week afterwards he went into hospital for two days, when, feeling much better, he left. From the time he went out to the date of his re-admission, his symptoms continued with more or less severity, and he was unable to resume his work.

When first seen by me, on his second admission, he was suffering from many of the symptoms of laryngitis. There was a hoarse cough, with somewhat stridulous breathing; harsh laryngeal sounds heard on auscultation, with pain on pressure over the larynx. There was a history of an old syphilitic affection. The chest was examined, but not carefully, and no dulness was detected. The breath-sounds over the lungs, although feeble, were good. The patient was unable to lie down, and was propped up by a bed-chair.

The symptoms continued with but little change; his face assumed an aspect of great anxiety. There was urgent dyspnœa, with loud, ringing cough. At times, however, the breathing was natural.

On the 3rd January I made a very careful examination of the patient. I had previously expressed an opinion that there was some lurking disease, probably aneurysmal, and that the laryngeal affection was of a spasmodic character, the result of some distant irritation.

On feeling the pulse of the two arms, a marked difference was perceptible. On the right side the pulse was very small, on the left moderately full. There was slight dulness opposite the first piece of the sternum, extending two inches downwards from its upper edge, and one inch and a half to the right of the bone. There was an indistinct pulsation in the first and second right intercostal spaces close to the sternum, and a very slight beating was observable, on close observation, at the lower part of the neck, on the right side. There was a slight prominence of the right side of the chest at the seat of dulness. The heart-sounds were normal, but faint; no bruit was audible over the seat of pulsation, or elsewhere.

On the 4th of January he complained of pain in the right arm, and in the right side of the chest, and of dyspnœa after swallowing. On the night of the 6th January he had a most violent attack of dyspnœa, which lasted for two hours. On the 9th I made the following note: "Pulse 76, regular; very small in the right wrist; there is more dyspnœa." On the 14th the symptoms were more urgent: there was more cough and some expectoration. On the 18th the pulse was intermittent; the sputa were purulent and copious. Dysphagia was complained of.

But little change took place from this period, except that indications of the existence of a low form of pneumonia became daily more marked. The paroxysms of dyspnœa, however, became less frequent. He was quite unable to lie down, or even to lean back; and his constant position, night and day, was that of leaning forwards in bed, resting on a bed-table, his head supported by his arms. On the morning of the 31st January he died. He had got out of bed, when he suddenly coughed up a large quantity of blood, and before the house-surgeon could reach him he was dead.

Autopsy.—On removing the sternum and costal cartilages a tumour was seen occupying a position behind the upper half of the sternum, and extending slightly on either side. This tumour was an aneurysm, about the size of an orange, connected with the ascending portion of the arch of the aorta. Anteriorly the aneurysm had pressed against the upper part of the sternum, and had produced slight absorption of that bone. The tumour contained anteriorly a quantity of soft fibrinous clot, evidently of not very old formation. The tumour pressed on the trachea, and had ulcerated through that tube at about an inch and a half above its bifurcation. The aneurysm had thus burst into the trachea. The opening, as seen at the autopsy, was plugged with a soft, dark-coloured coagulum.

The anterior portions of the upper, middle, and lower lobes of the right lung, were the seat of grey hepatization. Both lungs contained blood.

The heart was rather small; it had a deposit of fat on its surface; its valves were healthy. The aorta was atheromatous; the larynx was healthy.

Remarks.—The laryngeal symptoms and the supervention of pneumonia are important features in this case. It is no uncommon thing to find that the first symptoms to attract attention in thoracic aneurysm are those of spurious laryngitis; and the symptoms are of so deceitful a character that even the most cautious physicians have sometimes been misled by them, and have recommended that the operation of tracheotomy should be performed, under the impression that there has been some organic constriction of the glottis. In the case which I have just related I did not satisfy myself for a few days of its exact nature, but the careful physical examination I made on the 3rd of January at once removed all doubt from my mind.

There was one circumstance which, on a mere superficial consideration, would tend to produce an erroneous impression. It was this:—On first seeing the patient I noted the laryngeal symptoms alone, and I directed that hot moist flannels should be kept constantly applied over the larynx. From this the patient experienced great relief, not only at first, but up to the period of his death; so that whenever he found an attack of dyspnœa coming on, he used to beg of the nurse to apply these hot flannels. It is somewhat curious that a local application of this kind should give relief to a spasm depending upon a distant irritation.

The important practical point to be drawn from a case of this kind is, that whenever laryngeal symptoms of such a nature occur, we should look well, in order to ascertain whether they may not be simply and solely of a reflex character, before we give a decided diagnosis, or before we recommend that the trachea should be opened.

I would remark next with reference to the inflammation of the right lung. This is a result which very frequently occurs in thoracic aneurysm, and seems to be due to the pressure which the tumour exercises on the nerves supplying the lungs. The result resembles that which follows when the pneumogastric nerves are divided; for we then observe, first, a passive congestion, and, subsequently, a low form of pneumonia, developed. The symptom is one of very considerable interest and practical importance, as it may be the means of producing a fatal result before the aneurysm has had time to ulcerate into any great cavity, so as to give rise to death from hæmorrhage.

CASE III. *Thoracic Tumour (Aneurism?); Improvement under Treatment.*—William R., sixty-three years of age, a labourer in an iron-foundry, was admitted into the Liverpool Northern Hospital, under my care, on the 25th August, 1862.

The history he gave was as follows:

He had been ill about three weeks, but had only left off work for ten days. The first symptoms he felt were a sort of fainting when he stooped, and a choking sensation in the throat. During the previous week he had had occasional fits of dyspnœa. He said he had never had any serious illness; he had suffered slightly from rheumatism, but had never had rheumatic fever.

He complained of a sensation of weight in the chest and of pain in the neck; the face was swollen and livid. This swelling had existed, he said, for about a week. The superficial veins of the chest and neck were enlarged, and formed a visible plexus. The veins of both arms were very tortuous. The pulse was 76, and much smaller in the right arm than in the left. He breathed easily when he sat or stood, but with difficulty when he lay down. In the latter position the breathing became of a stridulous character. There was œdema of the integuments of the chest, but not of the legs.

The chest in front was resonant all over the left side. On the right side there was resonance below, and at the upper and outer part. There was dulness over a space occupying the upper half of the sternum, and extending two and a half inches to the right of that bone, but not passing to its left. Both lungs were resonant behind. There was slight prominence of the right side of the chest, opposite the seat of dulness. No pulsation could be felt over the tumour; the cardiac sounds were audible over it, but there was no bruit. The apex of the heart was felt, and seen, beating two inches to the left of, and three and a half inches below, the left nipple. A systolic bruit was heard at the apex of the heart. There was increased dulness in the cardiac region. Both pupils were of the same size. The urine was examined and found free from albumen.

On the 29th there was more swelling of the chest walls, and the upper extremities were also swollen, especially the right. On the 2nd September the dyspnœa was rather less. There was distinct pulsation over the tumour. On the 9th there was less venous congestion of the surface of the chest, and the breathing was less stridulous when he lay down. He was better able to lie on his back. The cardiac systolic bruit was audible at the base as well as at the apex of the heart.

On the 16th the right pupil was observed to be more contracted than the left.

On the 4th October I made the following note—" He fell down last night, but soon recovered himself. There is great œdema of the right arm. The extent of dulness is somewhat greater than it was. Both pupils are of the same size."

On the 25th the dulness was found to extend three inches to the right, and an inch and a half to the left, of the upper half of the sternum. The impulse was about the same; the breathing was decidedly better.

On the 11th November he spat up a little blood. He complained of feeling a weight under the right breast. The tumour was more prominent, but the impulse about the same. Pulsation could be felt deep in the episternal notch.

At the end of November the œdema of the arms, and the venous congestion of the chest walls, had almost subsided. On the 20th December the dulness had increased; in fact, it extended nearly over the whole of the anterior part of the right side of the thorax. There was less pulsation. No breath sounds could be heard in front on the right side, but vesicular breathing was audible behind.

The patient remained in the hospital till the beginning of January, 1863, when he was discharged. There was at that time no œdema of either arm, and no venous congestion of the walls of the chest. The pulsation over the tumour was decidedly less than it had been. He could lie down, slept well, and had very little dyspnœa. He was able to go about, and as long as he kept himself tolerably quiet all went well. I have not seen him since the date of his discharge.

Remarks.—Although there was no opportunity by post-mortem examination of verifying the diagnosis in this case, there can be, I think, little doubt of the nature of the disease, which must have been either aneurysm or pulsating vascular tumour. The symptoms and progress of the case point to the former affection. The chief interest lies in the steady and progressive improvement which took place, as contradistinguished from the progressive decline and rapidly fatal issue which characterised the two preceding cases. That the tumour became larger and more solid is evident from the increase in the extent of dulness, and the diminution in the impulse. There can be no doubt, I think, that a deposit of fibrine took place in the aneurysmal sac, and that its cavity became diminished in size; that, in fact, the disease was in process of cure, so far as cure can be accomplished in such cases.

The treatment adopted consisted in occasional cupping, to the extent of four or six ounces, the careful regulation of the diet and of the amount of exercise taken, and the administration of a purgative from time to time. He was cupped about once a month. He took digitalis for a short time. The bowels were kept well open, but he was not purged. His diet consisted of a small quantity of meat daily, and he was ordered to take very little fluid and vegetables. He was, except at first, when he was kept quite quiet, allowed to go about, and was a good deal in the open air.

CASE IV. *Aneurysm of the Arch of the Aorta. Death from Secondary Diseases. Autopsy.*—Celia P——, thirty years of age, a somewhat plethoric woman, was admitted into the Liverpool Northern Hospital under my care on the 10th April, 1862.

She gave the following history: In November, 1861, she first felt a beating over a small spot opposite about the third or fourth left costal cartilage. The beating gradually increased, and a swelling soon became apparent; this latter also increased, but for the nine or ten weeks previous to her admission she thought there had been no enlargement in it. She had had a good deal of pain in the back and left arm. She complained of a constant beating in the chest, and of inability to lie on the left side; there was pain in the left shoulder, and pain shooting down the left arm, with numbness and tingling of that limb; the veins of the left breast were enlarged. There was a distinct bulging of the left side of the chest, extending from about the level of the lower third of the sternum nearly up to the clavicle. The swelling was seen, and felt, to pulsate strongly. The pulsation was strongest, and the swelling most prominent, opposite the fourth left rib. There was dulness on percussion over the swelling; this dulness reached from the cardiac region up to the clavicle, and extended three inches to the left of the sternum. The pulse was 92, and regular; much smaller on the left side, both in the arm and wrist, than on the right. There was a slight bruit with the first sound of the heart. There was very little dyspnœa, and the patient could lie on her back; the chest was resonant behind, and the breath sounds were normal; there was a good deal of pain over the tumour.

The patient remained in the hospital till the 10th May, when she wished to go home to her friends. At the time of her discharge the pain over the tumour was much diminished, and, generally, she was improved, but there was no diminution in the size, or impulse, of the tumour. She suffered whilst in the hospital but little from her ailment, and could scarcely be made to believe that she was the subject of a serious malady. (The treatment adopted consisted in the application of a belladonna lotion over the tumour—which had a decided effect in relieving the pain—rest, a somewhat spare diet, an occasional aperient, morphia at night, and one venesection to 6 oz.)

On the 27th May, a little more than a fortnight after her discharge, she came to see me. There was no perceptible change in her symptoms.

The next time I saw the patient was on the 18th June, 1863, nearly thirteen months from the above date. I found her still somewhat stout, but less so than in the previous year. A month after leaving the hospital she had gone into service, but had done no heavy work. She remained in her place nine months, and then went home. She said the beating in the tumour was stronger than before, and she could sometimes "hear it whistle like a bird." She complained of great pain in the tumour at times, and of dyspnœa on exertion. She could lie down, and slept tolerably well. The tumour had extended upwards, and was very prominent just below the sternal end of the clavicle. At this spot its walls seemed very thin, and the pulsation was very strong. A double murmur was heard over the tumour, and more or less distinctly over the whole chest, both in front and behind. The second murmur was quite of a musical character; it was synchronous with the diastole of the heart, and was, I have little doubt, propagated from the aortic valves. The pulse was very feeble in the left arm, but good in the opposite side.

On the 19th July she applied for readmission into the hospital, where she remained till the 18th August. During this time she complained much of dyspnœa and dysphagia, was unable to lie on her back, and had severe aching pain in the back and left side, and, at times, a hard ringing cough. She suffered much from vomiting, and took but little food. At her discharge the pulse was scarcely perceptible in the left wrist; the double murmur was audible, but the second portion was not musical as before; the breath sounds at the back of the left lung were good.

She died at Runcorn, in Cheshire, on October 9th, 1863; and I am indebted to my friend Mr. Wilson, of Runcorn, who sent the patient to me, and who watched her up to the time of her death, for a careful account of the autopsy, and for the parts involved in the tumour, which he removed. Speaking of her symptoms before death, Mr. Wilson says: "She did not die suddenly, but became gradually asphyxiated. For some days before her death the countenance was purple, the dyspnœa extreme, and the pulse imperceptible." The chief points of interest in the autopsy are these: the left pleura contained a large quantity of fluid, and the left lung was carnified; the pericardium also contained much fluid. There was a large aneurysm connected with the arch of the aorta, commencing about two inches beyond the semilunar valves, and involving the whole of the arch to its termination, as well as about an inch of the vessel beyond. There were two distinct pouches in the aneurysm; the first led between the third and fourth ribs of the left side, and presented outwards between them; the third rib was dissected and laid bare by the aneurysm; the second pouch was between the first and second, and second and third left ribs; the second rib was completely dissected, and projected into this pouch, which presented opposite the second rib. The semilunar valves of the aorta were the seat of atheromatous deposit. The aorta, just beyond the valves, was dilated, and was the seat of atheromatous and calcareous degeneration. The mitral valve was healthy; the left ventricle was of normal thickness.

Remarks.—The length of time during which the disease existed after it had assumed a large size, without giving rise to any symptom of a very urgent or distressing character, is an important and interesting feature in this case. There were no laryngeal symptoms; for a long time there were no violent attacks of dyspnœa; there was nothing, in fact, but the swelling, the pulsation, the pain, and the dyspnœa on exertion. I think this result must be attributed to the course the aneurysm took—viz., forwards, pointing through the intercostal spaces. Taking this course, it exercised no great amount of pressure either on the trachea or on the root of either lung, and thus there were no reflex spasms set up in those organs.

The peculiar musical character of the murmur was a phenomenon more interesting than important in a diagnostic point of view. I have occasionally heard murmurs of this kind in cardiac disease, but they are by no means frequent. The loudness of the murmur, so as to be at times audible to the patient, is a further point of interest. It is rare that patients hear their own cardiac or aneurysmal murmurs; and I think it is even still more rare that a murmur should be so loud as to be audible to a bystander without the ear being brought either directly, or indirectly, through the medium of a stethoscope, in contact with the chest walls. One instance, and only one, of this kind I have met with. It was a case of disease of the aortic valves, and the murmur was so loud that it could be heard when the ear was placed within a foot of the chest. The post-mortem examination showed nothing unusual; there was a deposit on the aortic valves rather pea-like, but apparently similar to other deposits which give rise to ordinary murmurs.

CASE V. *Aneurysm of the Descending Thoracic Aorta becoming Diffused in the Abdomen. Death from Exhaustion. Autopsy.*—This case was one of a very remarkable character, and shows the curious course that a thoracic aneurysm may take. It occurred in the practice of Dr. Lister, of this town, and was seen by several medical men. I had frequent opportunities of examining the patient, and watched him up to the time of his death. I was also present at the autopsy.

In the spring of 1857 I was requested to see a man who had a tumour in the right iliac fossa. The history of the case was that, for some time previous (a few weeks), the patient had had severe pain deep in the iliac fossa, and soon a tumour developed itself, and was found to pulsate. The tumour was thought by myself, and those who were present at the time I saw it, to contain fluid, and the supposition was that it was an abscess seated over the right iliac artery. At a subsequent visit it was resolved to pass an exploring needle into the tumour. This was accordingly done, when nothing but blood escaped. It now became evident that the tumour was either aneurysmal or fungoïd. It gradually increased in size until it occupied the whole iliac fossa, extending upwards as high as the crest of the ilium. It pulsated strongly. The patient became exceedingly feeble, and could scarcely be raised into the sitting posture for fear of syncope occurring.

From the general character of the tumour, as it grew larger, I expressed an opinion that it was aneurysmal. At the same time, from the absence of bruit, which was never heard in front of the tumour, and from other circumstances, doubt was expressed, by some who saw the case, of the correctness of this diagnosis.

Within a day or two of the patient's death, on listening behind, a bruit was audible at one spot on the spine, about the commencement of the lumbar vertebræ.

The patient died on the 12th May, and the autopsy was made on the following day.

Autopsy.—On opening the abdomen, a large tumour was found projecting on the right side, pushing before it the peritoneum and right kidney; the ascending colon was pushed quite to the median line. The tumour filled the right iliac fossa, and extended upwards to the diaphragm, and backwards to the spine. It lay over the right external iliac artery, so as completely to conceal that vessel. The abdominal muscles, laterally and behind, were in close contact with the tumour, and formed its walls, so that they could not at all points be separated from that which formed the proper wall of the tumour. On cutting into the tumour, the external portion was found composed of laminæ of fibrine of somewhat recent formation. These laminæ, together with the peritoneum and condensed cellular tissue, constituted the sac of a very large diffused aneurysm. The sac was filled with coagulated blood. The aneurysm was connected with the thoracic aorta opposite the last dorsal vertebra; it communicated with the vessel by means of a square-shaped opening situated in the posterior part of the vessel. This opening led to a sac which had three distinct pouches, all lying above the diaphragm. On further examination it was found that the aneurysm had passed beneath the ligamentum arcuatum internum, and behind the psoas magnus muscle, and had thus become diffused in the abdomen. The spot at which the original aneurysm had burst could not be discovered. The sides of the bodies of the two upper lumbar vertebræ were partly absorbed. The posterior part of the abdominal portion of the aneurysm was formed in great part by the quadratus lumbarum muscle. The tumour had caused absorption of the psoas magnus, and had dissected the lumbar plexus of nerves to a great extent.

As illustrating the symptoms which aneurysms or tumours occasionally produce, I will relate the following case, which, although it does not come under the head of thoracic aneurysm, and the diagnosis is open to objection from the absence of post-mortem examination, yet is of so instructive a character as to warrant me in referring to it.

CASE VI. *Aneurysm (?) of the Abdominal Aorta, pressing on the Stomach, and producing Symptoms simulating Bronchitis.*—In the autumn of 1861 I was requested to see a patient living at the north end of this town, the wife of a respectable mechanic. She was between thirty and forty years of age. The history she gave was, that for many weeks previously she had had symptoms which she could scarcely describe. She said she was sure she was very ill, and imagined there was something wrong with her chest, for she was constantly spitting up phlegm. She showed me a glass full of frothy fluid which she said she had brought up during the morning. Her countenance was expressive of great anxiety, but the only symptom she could definitely refer to was the frothy expectoration. She had been attended by a medical practitioner, who told her she had bronchitis, and treated her accordingly. Some of her symptoms had been relieved by the treatment, but at the time I saw her she was getting worse again. I examined her chest, and found no symptoms of bronchitis, nor of any other pulmonary affection. The heart sounds were normal, and there was no increased dulness in the cardiac region. On questioning her carefully about the fluid said to be expectorated, I found that it did not come up with a cough, but seemed to find its way insensibly into her mouth, and then she spat it out. On examination, it looked like frothy saliva rather than bronchial expectoration. This led me to make an examination of the abdomen. I found a large pulsating tumour, which I could distinctly define, in the epigastric region. The tumour seemed about as large as an orange, and pulsated very strongly under the hand. I had no hesitation in concluding that the case was one of abdominal aneurysm. I could give no other than an unfavourable prognosis. I saw the patient on two subsequent occasions, when I had further opportunities of satisfying myself of the nature of the case. The subsequent history I am unable to give.

There are certain diseases especially which may be mistaken for thoracic aneurysm; these are, general dilatation of the aorta, disease of the aortic valves, and thoracic tumours. I have notes of some cases of dilatation of the aorta, in which the general symptoms much resembled those of aneurysm; but it would occupy too much space to relate them. With reference, however, to cardiac disease and thoracic tumours, I will relate two cases of a somewhat instructive character. There can be no doubt that there is a great deal of difficulty at times in diagnosing whether a bruit heard over the aorta is connected with incipient aneurysm or disease of the aortic valves; but, as a rule, I think a careful consideration of all the features of the case will enable us, in a large majority of instances, to give a decided opinion.

Case VII. I was consulted some years ago in the following case:—A gentleman, who had previously enjoyed good health, was seized with a good deal of pain about the sternum, throbbing in the neck, and a sensation of choking in the throat. He consulted two physicians, who expressed an opinion that the disease was aneurysm of the aorta. They gave an unfavourable prognosis. The effect on the patient may be imagined: all his symptoms seemed to increase, he became uneasy and anxious, his spirits drooped, and his friends were much alarmed about him. He continued in this state for six or seven months, at which time I first saw him. I found no dyspnœa, no dulness behind the sternum or elsewhere, no evidence of pressure in any direction; but I found distinct evidence of aortic regurgitation—viz., a diastolic murmur heard at the base of the heart and towards the right clavicle. There was the jerking pulse, so indicative of aortic regurgitation, with symptoms of slight hypertrophy of the heart. Rheumatic pains existed in different parts of the body, with symptoms of dyspepsia. I was able to assure the patient and his friends that I believed no aneurysm existed, and that, formidable, undoubtedly, as the affection—valvular disease of the heart—was, yet with due care and proper attention to the general health, life might be, not only indefinitely prolonged, but made free even from much discomfort. It is some years since this opinion was given, and the results have not falsified the prognosis. The patient rapidly recovered his spirits; his rheumatic and dyspeptic symptoms were relieved by treatment; and having had explained to him the exact nature of his ailment, and the precautions that were necessary, he has been able to live with comfort, and with but little sensation of his cardiac malady.

The following case will serve to illustrate the symptoms which occasionally arise in connexion with thoracic tumours, and which may lead to the supposition that an aneurysm exists:

Case VIII. Gustavus G., sixty-three years of age, was admitted into the Northern Hospital under my care on the 14th March, 1863. He was a man of sallow complexion and very unhealthy aspect. He said he had had difficulty of breathing and of swallowing for seven or eight weeks. He had suffered formerly from rheumatic fever. On making a physical examination of the front of the chest, I ascertained the following facts: there was no dulness on percussion, either over the sternum or at the upper part of the lungs. There was a distinct double murmur audible at the base of the heart and towards the right clavicle. The breathing was interrupted (wavy) at the right apex; on the left side it was good. The back of the chest was not examined. The patient was able to walk about, but had dyspnœa on exertion and when he lay down. He was consequently propped up in bed. There was a good deal of fulness about the neck, evidently depending on obstructed venous circulation. On the 21st March, a week after admission, œdema of the right arm came on. A careful examination was made of the pulse in the two arms; it was thought that the left pulse was slightly fuller than the right. On both sides the pulse was jerking.

He continued with but little change up to the 26th March, on the morning of which day, as he was leaning out of bed, he died suddenly.

Autopsy.—The heart was much enlarged, and fatty on its surface. The left ventricle and the aorta were full of dark fluid blood; the pulmonary valves were healthy; the aorta was dilated and atheromatous; the aortic valves were the seat of firm, warty deposits; the mitral valve was healthy. *At the root of the right lung there was a mass of scirrhous glands*, which must have compressed the superior vena cava, and probably the innominate artery. The œsophagus at its termination was much thickened, and had a scirrhous appearance. The thyroïd body was scirrhous; the gall-bladder contained forty-six gall-stones and no bile; the kidneys were healthy.

Remarks.—I had no difficulty, in this case, in deciding as to the presence of valvular disease of the heart. The symptoms pointed to aortic regurgitation; but the existence of dysphagia, the full condition of the vessels of the neck, and especially the œdema of the right arm, and the diminished volume of the right pulse, made me suspect that there was some thoracic tumour—an opinion which I expressed during the patient's life, without attempting to decide what was the exact nature of the tumour.

I now pass on to make a few remarks on the subjects of diagnosis and treatment.

Diagnosis.—In all cases of aneurysm of the arch of the aorta—the part which is most frequently attacked with the disease—I believe that the first least equivocal sign we should look for is a dulness opposite the upper part of the sternum. It is there that the tumour first begins to push aside the lungs, and to come in contact with the thoracic walls, and it is usually from this spot that the dulness extends either to the right or left side, according to the direction which the aneurysm takes. This dulness may, it is true, be caused by a tumour of a non-aneurysmal nature; and further, it may, when slight, be the result of a general dilatation of the aorta: for in one case which I met with some of the symptoms of aneurysm were present, and amongst them was a slight dulness opposite the upper portion of the sternum, but not extending on either side. In this case there were well-marked symptoms of aortic regurgitation, and I had no difficulty in concluding that there was valvular disease of the heart, with hypertrophy. There was some doubt, however, in my mind whether the dulness was due to an aneurysm of small dimensions, or a dilated condition of the aorta. The general symptoms made me incline to the latter view. Through the kindness of the gentleman under whose care the patient died, I ascertained the result of the post-mortem examination, and had an opportunity of seeing the heart and a portion of the aorta of the patient. There was no aneurysm. The heart was hypertrophied, and the aortic valves were incompetent. The aorta was very much dilated and atheromatous.

Bruit.—With regard to the existence of a bruit in aortic aneurysm, some diversity of opinion has been expressed. Guided by the result of their own experience, physicians have expressed their views according as a bruit has predominated in their cases, or the contrary. Looking back on the cases of aortic aneurysm which I have seen, both in my own practice and in that of others, and of which I have made a note, I find that in the majority no bruit was audible. In two of the fatal cases I have recorded in this paper, there was no bruit; so that although the existence of a bruit may assist us in our diagnosis, its absence is no proof whatever of the non-aneurysmal nature of a pulsating tumour.

State of the pupils.—The contraction of the pupil, as a consequence of thoracic aneurysm, is a symptom which has only of recent years attracted attention. The fact which this symptom indicates is pressure, or irritation of some kind, of the sympathetic nerve, and would occur in any case of thoracic tumour, and not simply in aneurysm. Still the knowledge of the symptom, and of its cause, is by no means unimportant, for without this knowledge we might be misled as to the nature of the symptom, and be unable to explain its occurrence. I have observed it as a permanent symptom more especially in aneurysms at the root of the neck; in some cases I have seen the pupil on the aneurysmal side only occasionally contracted, whilst again in others there has been no difference in the size of the two pupils.

But, important as it is to study the symptoms which characterize the formation of an aneurysm, and to recognise it at an early period of its existence, we should yet aim at a point beyond this. When once an aneurysm is formed, our treatment, at the very best, is only palliative, and often of no avail whatever. We should therefore endeavour to increase our knowledge of the nature, and early manifestations, of that diseased condition of the arteries which is the predisposing cause of most, if not all, aneurysms connected with the larger bloodvessels. The consideration of this subject is, however, beyond the limits of such a paper as this; and I must conclude with a few observations on the question of treatment, and the general principles on which it should be conducted.

Treatment.—I shall simply remark that the treatment I have adopted has been chiefly directed to two ends: 1st. To promote the formation of fibrinous deposits in the aneurysmal sac; and, 2ndly, to improve the nutrition of the arterial coats.

In attempting to carry out the second object, regard must be had to the nature of atheroma; and as all researches tend to show that it is essentially the result of an impaired nutrition, one great aim in the treatment of an aneurysm should be to improve this condition, and thus prevent the further development of the affection which has given rise to the tumour.

In the production of the first object, the formation of fibrinous deposits in the aneurysmal sac, quiet is, no doubt, one of the most important points to be insisted on; and it is remarkable how much better patients often become, when they are admitted into hospital, from this simple cause; and in considering the effect of drugs in favouring coagulation in an aneurysm, we must not forget to allow its due value to the rest which, I presume, we invariably prescribe. In some cases I have extracted blood in small quantities, from time to time, but not to the extent of weakening the patient. With regard to diet, I have always allowed a small quantity of meat daily, under the impression that, by keeping the blood at a fair standard, I was taking the best means of producing a deposit of fibrine in the aneurysmal sac, as well as of improving the general nutrition. In brief, I think the treatment of these cases should be directed towards keeping the circulation quiet, and maintaining the blood moderately rich in quality, but small in quantity; that everything having a tendency to make the blood either rich in water or poor in fibrine should be avoided.

With regard to the use of medicinal agents given with the view of producing fibrinous deposits, I must remark that iodide of potassium has recently attracted some attention. From my experience of its use I am unable to speak with any degree of confidence as to its value in this respect. I have given it on several occasions, but have been disappointed in its effects. It should be used, if at all, in large doses, and from the favourable results that have followed its administration at the hands of some practitioners, its power of consolidating an aneurysmal tumour appears worthy of more extended trial.

ART. IV.

The Effects of Carbonate of Potash on the Urine. By REGINALD E. THOMPSON, M.D. Cantab., &c. &c.

To make the urine alkaline by the administration of certain salts is, perhaps, the simplest problem in medical chemistry, and one which every physician knows how to solve most readily, and by various means; yet though there are many salts which are known to produce this result, the combinations which they undergo in their passage through the body, and the reasons of the difference in the quantity required to produce alkaline urine, have not even yet been fully investigated.

The well-known discovery of Wöhler, made by him many years ago, which established the fact of the conversion of the salts of the vegetable acids into carbonates during the passage through the body, opened out the right path towards the solution of these questions; and the next stage would seem to be to determine the alteration that takes place in the carbonates and bicarbonates; but though it has long been admitted that these salts must combine with some acid, and it has been shown that they eventually increase the acidity of the urine, I am not aware that any conclusive experiments have been made to determine what acid is eliminated by them.

The following series of experiments, made on a healthy individual, were undertaken with the object of determining whether any one of the following acids was increased by the administration of carbonate of potash—viz., hydrochloric, phosphoric, sulphuric.

That the bicarbonates and carbonates undergo an alteration in the stomach, is readily proved by the eructations of carbonic acid which follow the presence of these salts in an empty stomach; and the variation in quantity which is required to produce alkaline urine in different instances, may be accounted for by the combination with an acid in the stomach. The vegetable salts, it is well known, are more certain, and alkalinity of the urine can be far more readily induced by them than by the carbonates and bicarbonates, and by smaller doses. For instance, in seven cases where the urine was of normal acidity, two scruples of the acetate of potash were administered; the next sample of urine passed was found, in all cases, to be alkaline; whereas it required several doses (the number varied from four to eight) of the bicarbonate, administered in quantities of one drachm every four hours, to produce this result in others; and it is easy to show that only a portion of the acetate of potash is converted into carbonate. In four cases where the patients were taking eight and twelve scruples in the twenty-four hours, the presence of acetic acid was very readily detected after the distillation of only a portion of the urine. Perhaps the most satisfactory way of ascertaining the particular acid which the carbonate of potash eliminates from the system is to experiment on a healthy individual, by bringing the body into as stable a condition as possible, and carefully analysing the effect produced on the urine after a quantity of the salt has been taken; and it may here be observed, that though numerous experiments might be made on many individuals—as, for instance, on patients in hospital, who are on regular diet, and suffer only from trifling maladies—yet the results obtained cannot be looked upon as entirely satisfactory, principally from the fact that the urine cannot be collected in an absolutely accurate manner. The patients take no interest in the matter, and, indeed, have an objection to be the subjects of experiments. Hence it is far more satisfactory to make the experiments on some one interested in the subject; and for this reason, the series that can be made must be limited in number.

In the following experiments the daily life was as regular as possible. There were certain hours for exercise, study, and sleep; the diet, without being weighed (for it then becomes exceedingly irksome to the patient, without any corresponding advantage being obtained unless the food is identically the same from day to day) was restricted, the quantity of liquid being measured, the object being to produce a stable condition of the urine. Notwithstanding, however, great care, external circumstances—such as weather, temperature, &c.—produce effects which it is impossible to prevent; still an examination of the tables will show that a fairly stable condition of the urine was obtained.

The variations existing between the two tables must be referred to the different time (involving different weather) at which the two series were made.

In experiments of this kind it is necessary, before an analysis of the urine is made from day to day, to allow two or three days to pass before an equable condition of the body can be obtained, a very marked deficiency in the quantity of urine passed on the second day being the result of a restriction of diet. In the present instance the urine was not collected until the body had been in training for four days.

With reference to the mode of analysis adopted, it may be well to mention that the sulphates and chlorides were determined in the ordinary way by the estimation by weight of sulphate of baryta and chloride of silver respectively; for I have obtained only approximate and rough results by the volumetric processes proposed for these purposes; but as the determination of the phosphoric acid by the usual method is a tedious process, I adopted the admirable and very accurate volumetric process proposed by Neubauer, and fully described by him in his work on the Urine. I ascertained by experiment that the accuracy of the result obtained by the uranium process is not affected in the second place of decimals. The measures used were the French, the quantity of urine being represented in centimetres and the quantity of acid in grammes. The following tables show the results obtained; the first column gives the date, the second shows when the salt was taken, and the other columns are sufficiently indicated.

Series A.

Day.		Quantity.	PO_5	SO_3	Cl.
1 ...	Free	... 820	... 2·345	... 1·824	... 3·738
2 ...	„	... 810	... 2·392	... 2·349	... 2·383
3 ...	„	... 750	... 2·490	... 2·085	... 2·615
4 ...	120 grs. of carb. of potash	... 1130	... 2·712	... 2·147	... 2·481
5 ...	Free	... 1005	... 2·351	... 1·758	... 2·450
6 ...	„	... 805	... 2·624	... 1·984	... 2·966

In this series the carbonate of potash was taken in one dose on an empty stomach during the first twelve hours of the day. From an inspection of the table it will be seen that the acid which shows the greatest increase is the phosphoric; there being also a small increase in the amount of sulphuric acid; the hydrochloric is not increased.

In the next series of experiments the quantity of potash was doubled, and the amount divided among four doses, 120 grains being taken during the first twelve hours of the fourth and fifth days.

Series B.

Day.		Quantity.	PO_5	SO_3	Cl.
1 ...	Free ...	1020 ...	2·652 ...	1·773 ...	4·335
2 ...	" ...	1215 ...	3·523 ...	2·089 ...	6·227
3 ...	" ...	1095 ...	3·066 ...	8·015 ...	5·338
4 ...	120 grs. of pot. carb. ...	1140 ...	2·872 ...	2·109 ...	5·101
5 ...	" " ...	1065 ...	7·199 ...	1·800 ...	3·856
6 ...	Free ...	1020 ...	7·898 ...	1·656 ...	3·797

The results obtained in this second series, though resembling the former in the main point—viz., the increase in the phosphoric acid excreted—differ, as it will be seen, materially; the excretion of the phosphoric acid is shown to take place not on the day when the carbonate of potash was first taken, but on the following days; the sulphuric acid is increased as before on the fourth day, the hydrochloric acid is diminished. That the transmission of the potash through the body is hindered by the division into small doses I will show presently, an accurate analysis having been made of the amount of potash excreted each day; but it is not easy to account for the excess of potash excreted, after taking into consideration the sulphuric acid to be satisfied, which would take up but a small amount.

Of course some of the potash is excreted in the form of carbonate, and though it is unprofitable to surmise, it is, I think, not improbable that some portion may pass out in the form of a bibasic phosphate.

As it has been stated that the effect of the administration of an alkaline carbonate is to increase the quantity of earthy phosphates only, an analysis of the earthy salts was made for Series A.

The total quantity of earthy salts obtained from the urine collected on the third day was ·52 *gramme.* On the fourth day when the potash was taken, they amounted to ·76 gramme, and on the fifth day they fell to ·52 gramme. I think it is a matter of greater interest to investigate the amount of potash excreted in both series of experiments, and I consequently made a careful determination of the soda and potash, a process which is somewhat tedious and requires much care.

The following table gives the results obtained from an examination of the urine collected during the third and fourth days of Series A :

Series A.

Day.		Total Alkalies.	Soda.	Potash.
3 ...	Free ...	7·500 ...	5·675 ...	1·825
4 ...	After 120 grs. of pot. carb. ...	9·090 ...	4·140 ...	4·950

The excess of potash regained on the fourth day after the potash had been taken, may be reckoned as about 3·000 grammes. Now 120 grains of the carbonate of potash contains 64·8 grains of potash, which is equivalent to 4·199 grammes; hence it appears that nearly three-fourths of the potash was passed on the same day that it was taken.

In the following table the analysis of the alkalies for Series B is given. The potash in this series was taken in divided doses :

Series B.

Day.		Alkalies.	Soda.	Potash.	Excess of Potash.
3 ...	Free ...	12·456 ...	11·518 ...	·938	—
4 ...	After potash ...	14·212 ...	10·661 ...	3·551 ...	2·613
5 ...	After potash ...	17·018 ...	11·869 ...	5·149 ...	4·211
6 ...	Free ...	9·776 ...	6·602 ...	3·174 ...	2·236

The excess of potash is here estimated by subtracting the amount of potash obtained on the third day; of course there will be some slight variation from day to day. Calculated, however, in this manner, the total excess of potash amounts to 9·060 grammes. The total amount of carbonate of potash taken was 240 grains, which is equivalent to 8·398 grammes; the difference, which is not large, may fairly be set down to diurnal variation.

After dividing this excess—viz., ·662 grammes, equally among the last three days, I find the potash was excreted in the following manner: On the fourth day, 2·393 grammes; on the fifth, 3·991 grammes; on the sixth, 2·014 grammes.

Supposing, then, that the potash was passed in a similar manner on both days, it may be easily calculated that the potash taken on the fourth day was excreted in two portions—viz., 2·393 grammes on the fourth day, 1·806 grammes on the fifth. Similarly it may be calculated that the potash taken on the fifth day was also excreted in two portions—viz., 2·185 on the fifth day, and 2·014 on the sixth.

It is interesting to observe that more potash was excreted on the day it was taken, when the dose was undivided, than when it was separated into small quantities.

All these results I had hoped to have verified by a duplicate series of experiments; and in a similar series to Series A, but made with the bicarbonate instead of carbonate, I confirmed the fact of the increased excretion of phosphoric acid; but as the experiments were made with the bicarbonate, and some variation was found in the amount of the other acids excreted, I have thought it better to keep the two sets separate.

The effect produced by the successive doses of the salt in Series B was that of inducing a state of depression and nervous irritation exceedingly irksome to endure, which reached its highest point on the sixth day, when it was subsequently proved that the greatest amount of phosphoric acid was excreted. I am glad to find that the results obtained find much support from a case recorded by Dr. Parkes in his work on the Urine. The case I refer to is one of gout, where the urine was analysed before and after the administration of eight scruples of the bicarbonate of potash: the phosphoric acid was found to be increased by the salt from 9·445 grains to 27·534; and again on another day, from 13·666 grains to 21·88 grains. The sulphuric acid was also increased, though in a less degree.

The experiments here recorded, as they stand, may I trust be of some practical use; and at least they explain some of the effects produced by repeated doses of a carbonate. Few patients can undergo a long course of the salt without being much depressed and weakened; and the nervous state which is generally (and was certainly during the above experiments) induced, may be fairly referred to the great elimination of phosphoric acid, an element which is of primary importance to the well-being and proper function of the nervous system. Hence the necessity, which is recognised by many physicians, of combining some tonic with the salt, if it be desirable to keep the urine alkaline for any length of time by its means. If it be desirable to render the urine alkaline by means of the carbonates or bicarbonates alone, it should be done by the administration of a large dose at first, and not by repeated doses of smaller quantities.

Art. V.

On a Case of Syphilitic Affection of the Liver. By T. Grainger Stewart, M.D., F.R.C.P.E., Pathologist to the Royal Infirmary, Lecturer on General Pathology and Pathological Anatomy, Edinburgh.

In the following paper I propose to describe a rare form of waxy or amyloïd degeneration of the liver, and to indicate its relation to the hitherto recognised syphilitic affections of that organ. The patient from whose body the specimens were obtained was under my observation for about four years, and the history of his case has been recorded as a typical instance of the symptoms which attend the waxy degeneration of the kidneys and other organs.[1] I subjoin an abstract of the case.

Edward Burns, a bricklayer's labourer, aged thirty, first came under my observation in the Royal Infirmary, in January, 1860. His general health had previously been good, excepting that for some years he had been affected with constitutional syphilis. His throat was ulcerated, his voice was husky, and he had a harsh cough. The respiratory murmurs were harsh, but the percussion notes were normal; the cardiac sounds were natural; the blood was poor in corpuscles, the white relatively more numerous, the red pale and flabby. The tongue was clean, the appetite pretty good, and the bowels open. The liver extended from the sixth rib to the umbilicus; the spleen was also enlarged. He passed upwards of 100 oz. of urine daily; it was of low specific gravity, never contained a trace of sugar, but abundant albumen, and a few hyaline tube-casts. There was no dropsy, or at the utmost a little œdema of the feet at night. He remained in the Infirmary about four months, and under iodide of potassium his liver diminished considerably. During the years which followed, his liver gradually diminished, while his urinary symptoms remained unaltered. The respiration became by degrees more interfered with, and ultimately a blowing murmur with the first sound became audible over both base and apex of the heart. He died in November, 1863, of bronchitis and œdema of the lungs.

Autopsy.—The body was somewhat emaciated. The heart was enlarged; its left side was much hypertrophied; the aortic valves were competent, but there was a calcareous mass at the base of one of the

[1] Edin. Med. Journal, Feb. 1861, and Aug. 1864.

segments; the aorta was very atheromatous. The lungs were extremely œdematous; the bronchi were congested, and full of mucus. The liver was about the natural size; on its surface were a number of nodules and cicatrices; at the bottom of some of the latter nodules were visible. On section, numerous nodular masses were found scattered throughout the organ; they were pale in colour, dense in structure, and in their general appearance closely resembled bees'-wax. Their structure was very much denser than that of the surrounding tissue. In some nodules there were streaks of fibrous tissue throughout the substance and round the margin; and the greater the proportion of these tissues, the deeper were the cicatrices. In the nodules which were elevated above the surface there were no such streaks, or very few; in those situated at the bottom of deep cicatrices the fibrous element was abundant, or even in excess of the glandular. The fibrous bands passed into the tissues around the cicatrices and nodules. On applying iodine to these masses, the whole of the waxy-looking material assumed the brownish-red colour characteristic of the amyloïd degeneration; but the fibrous streaks simply assumed a yellow tinge. On microscopic examination, the masses were found to be composed of amyloïd or waxy hepatic cells; enlarged, transparent, and finely granular. In some parts the cell-elements were broken down, and a finely granular material, containing some oil-globules, was present. The fibrous tissue in the masses presented exactly the characters of ordinary connective-tissue; and where it was most abundant the cells were most atrophied. Throughout the rest of the organ the cells were little affected with the waxy degeneration; but some of the small vessels showed it distinctly. The spleen contained one cicatrized mass, which presented no reaction with iodine. The cortical substance of the kidneys was somewhat contracted; the small arteries and Malpighian bodies afforded an excellent example of the amyloïd degeneration. There was some degree of amyloïd degeneration in the villi of the small intestine; the bowels were otherwise natural. The prepuce presented traces of an old chancre, and it had been previously ascertained that there were numerous syphilitic ulcerations of the throat.

It is evident that the waxy degeneration of the liver, in this case, was very different from the form of that degeneration usually met with in two respects—viz., first, that in the bulk of the organ, instead of affecting the cells it affected the vessels; and secondly, that groups of nodules in individual parts had become completely degenerated, every cell presenting an exquisite specimen of the degeneration, and the masses scattered like cancer nodules throughout the whole substance, and presenting an appearance exactly like bees'-wax.

It is well known that the amyloïd degeneration is closely related to constitutional syphilis, and in this case there can be little doubt that it was induced by that affection; but the peculiar form which occurred in the liver bears a certain relation to the hitherto recognised effects of the venereal poison on that organ, and seems to me to throw light upon the mode of origin of these lesions. Let us therefore first inquire what are the venereal affections of the liver.

Professor Dittrich, of Prague, first drew attention to these affections in his excellent paper in the 'Prager Vierteljahrschrift' for 1849. The conclusions at which he arrived were the following:

1. The participation of the liver in constitutional syphilis consists in an inflammatory exudative process, of which the most common termination is healing, either perfect or imperfect, leaving a cicatrix composed of fibrous tissue, with or without some granular matter enclosed within it. The exudative process never affects the liver substance as a whole, but only individual scattered parts.

2. The healed exudative process in the liver sometimes leads to no apparent consequences, sometimes to important lesions of the organ itself, or of the whole organism.

3. The participation of the liver in the syphilitic infection is usually in the period of the so-called secondary affections.

4. The rest of the organ may be subject to syphilitic or non-syphilitic affections.

5. The syphilitic blood-disease is either simple or combined with other dyscrasiæ, particularly the tuberculous, and the exudations in the liver are correspondingly modified.

That an exudative process is at the foundation of the syphilitic affection of the liver Dr. Dittrich thinks beyond doubt, although from the non-fatal character of the affection the earlier stages of congestion, swelling, and exudation are not seen. He conceives that the products vary according to the character of the exudation—one part plastic and capable of organization with fibres, another soft and glue-like, and more or less readily absorbed and removed. In a third part another form appears, which neither goes on to form fibres nor is absorbed, but gradually dries up, becomes firmer and harder, and forms a greyish white or whitish yellow mass of a tough and leather-like consistence. Microscopic examination shows that these are composed of fatty and other granules, structures resembling nuclei, and shrivelled atrophied cells and ill-formed connective-tissue.

Such are the views of Dittrich as to the characters and mode of production of the syphilitic affections of the liver. I shall quote from him one special description of a case closely resembling mine:—"On the surface of the liver were numerous cicatrized depressions; in the deeper part of both lobes there were yellow rounded masses of the size of a hazel-nut, which showed towards the surface a lardaceous, fibroïd, callous tissue, with a yellow, cheesy, tuberculous mass enclosed in the centre." The proportions of these two materials varied in different nodules.

The observations of Virchow[1] and Wilks[2] have extended, confirmed, and in so far corrected the opinions of Dittrich; and the general view of pathologists is that, in connexion with constitutional syphilis, cicatrices and occasional nodules are met with in the liver, and that they are results of a simple or gummy inflammation of portions of the organ.

This case, I think, proves that the cicatrices may result from amyloïd or waxy degeneration. There can be no doubt that the lesions

[1] Virchow's Archiv, Band xv.
[2] Wilks on the Syphilitic Affections of Internal Organs.

in this case were results of syphilis, that they occurred in a syphilitic patient, and presented the characters of such affection. I shall therefore take this for granted, and proceed to inquire as to their probable mode of origin. The constant association of the cicatrices with the waxy masses make it essential for us to consider the two lesions together, and it seems to me that only three hypotheses can be advanced—viz., 1. That the two are quite independent lesions. 2. That the formation of the waxy masses is secondary to the cicatrices. 3. That the cicatrices are results of transformation of the waxy masses.

The first of these theories is untenable, seeing that all the cicatrices had waxy masses at their bases or in close connexion with them, and that, as we shall presently see, definite relationship existed between the two. The second also falls to the ground, when we consider that there were many waxy nodules in the organ when there was scarcely a trace of cicatrix, and no cicatrix when nodules did not exist; and even when they co-existed, the deeper the cicatrix was, the less was the nodule, while it would have been natural to expect if the nodules resulted from the cicatrices that the reverse would have been the case. The third hypothesis, on the other hand, is recommended to us by many considerations. There was no cicatrix without a corresponding waxy mass, and there were many masses without a cicatrix. This fact alone renders it very probable that the cicatrices resulted from the masses; but when we inquire more closely into their structure, it becomes much more apparent, for then it becomes evident that the depth of cicatrix bore a definite relation to the condition of the masses. Some of them consisted simply of extremely degenerated cells. This appeared to be the first stage; and so far from there being any cicatrix connected with them, they formed prominences above the general surface. (Fig. 1.) Others had bands of connective-tissue radiating among their waxy masses, and the gland-cells were proportionally atrophied. This seemed to be the second stage, and with it a certain amount of depression and puckering of the surface was observed. (Fig. 2 *a.*) Others, again, had comparatively little gland-structure and a greater proportion of connective-tissue. This is the third stage, and with it the deepest cicatrices were associated. (Fig. 2 *b.*) It is thus apparent that the cicatrices were distinct in proportion to the alterations in the waxy masses. In one part, indeed, the gland-tissue had almost disappeared, leaving only groups of molecules, nuclei, and disintegrating cells, and only the fibrous masses remained, and in that part the deepest cicatrix in the whole organ was situated.

But granting that the waxy masses preceded in order of time the formation of the cicatrices, it might be asked whether they were not peculiarly modified gummy tumours, and thus the change might yet be traceable to inflammation. A glance at their microscopic structure disposes of such a view, for it shows that the masses were composed of closely aggregated degenerated hepatic cells, and presented none of the characters of a gummy tumour.

The series of changes, then, I conceive to have been the following:

1. Extreme waxy or amyloïd degeneration of certain districts or groups of lobules in the liver. (Fig. 1.)

2. A development of connective-tissue in these masses, gradually causing atrophy of the degenerated gland-cells, and leading to the formation of cicatrices. (Fig. 2 *a.*)

3. The cicatrized condition—bands of fibrous tissue radiating from a dense centre into the surrounding tissue, and enclosing within the remains of the broken down degenerated cells. (Fig. 2 *b.*)

This last is the condition which has been most frequently met with, and we can easily understand that such should be the case when we reflect upon the non-fatal character of the disease.

I do not, of course, deny that syphilitic cicatrices may arise from gummy or simple inflammations as has been described, but I think that the single instance I have adduced proves that they may be formed in another and altogether different way. It should also be borne in mind that no positive evidence has been adduced that inflammation precedes the formation of the cicatrices, while here, though only in one instance, we have a demonstration of the different stages. And this case opens up most interesting lines for further inquiry, particularly as to whether many syphilitic cicatrices throughout the body do not owe their origin to the waxy degeneration, and as to the whole relation of syphilis with lesions of this class. It reminds me forcibly of a statement made by Von Baerensprung, that he saw the characteristic amyloïd reaction in matter derived from the base of an indurated chancre, and of a statement made to me by Dr. Patrick H. Watson, that he has often seen the skin of syphilitic patients in the Lock Hospital, in Edinburgh, present on section a peculiar waxy look, and that in one particular case he cut through the firm waxy skin, and not a drop of blood escaped. He did not test it with iodine, but afterwards surmised that he might have obtained the characteristic amyloïd reaction, as the tissues presented exactly the appearance of waxy organs. Further observation may prove that a waxy or amyloïd degeneration is more common, and leads to more secondary lesions than has been hitherto supposed.

I have published this case and these remarks now because I am anxious to direct attention to the subject, and from the rarity of such lesions I might have to wait long ere another case came under my notice.

P.S.—Since writing the above I have examined the specimens of syphilitic affection and of waxy degeneration of the liver in the pathological museums of Berlin and Prague, and found none exactly corresponding with that which I have described. Professor Virchow informed me that he had only once met with a *mass* of amyloïd matter in the liver; that that mass was solitary, and that he had not made out its mode of origin. We examined the specimen, which had been for some time in spirit, and found that it contained some waxy matter and some fibrous tissue, but were unable to satisfy ourselves regarding it. (Sept. 1864.)

PART FOURTH.

Chronicle of Medical Science

(CHIEFLY FOREIGN AND CONTEMPORARY).

HALF-YEARLY REPORT ON MICROLOGY.

By J. F. STREATFEILD, F.R.C.S.

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PART I.—PHYSIOLOGICAL MICROLOGY.

The Grey Substance of the Medulla Oblongata and Trapezium.—Dr. Dean, in his work recently published at Washington, gives the results of his protracted investigations of some disputed points. With regard to the "decussation of the hypoglossal roots," he says, at last, "I could have no doubt that some of them certainly decussate directly at the raphé, standing about in equal proportion to the main bundles, as do those of the anterior spinal roots which can be traced into the anterior commissure of the spinal cord. Some of the fibres of the hypoglossal roots, especially those lying along the inner edge of the bundle nearest the raphé, turn off either just before or immediately after they enter the broad band of marginal fibres, and pursuing the same course, proceed towards the raphé, where they decussate with their fellows from the opposite side. Schröder van der Kolk is undoubtedly right in his assertion that the great loops of decussating fibres figured by Kölliker, and named by Lenhossek *ansa hypoglossi*, are formed not from the hypoglossal roots, but by the band of border fibres described above, which he has clearly shown to be derived from the vagus; and as he has also pointed out, this adds greatly to the difficulty of deciding the question. Most of the fibres forming the hypoglossal roots undoubtedly penetrate deeply into the nucleus, as maintained by Schröder van der Kolk, but a careful and repeated examination, especially with high powers, has convinced me that some of them turn aside, and that a direct decussation exists of *a few* at least of the root bundles. In the cat, especially in the lower part of the hypoglossal nucleus, the course pursued by the roots is very distinct, and quite numerous bundles may be traced, accompanying the marginal fibres derived from the spinal accessory to the raphé; higher up the course is somewhat more obscure, as the band proceeding from the vagus is so much broader and more prominent than that from the accessory."

As to the passage into the medulla of the posterior vesicular columns and tractus intermediolateralis, his observations, together with those of Clarke and Schröder van der Kolk, tend to establish completely the important fact, "that the *respiratory centres* are brought into connexion with *descending fibres from the trifacial, forming together a system of descending longitudinal fasciculi connected with columns of cells, continuous with those in the cervical and dorsal regions of the spinal cord,* and thus connected with both *anterior* and *posterior* *cornua*, serving to bring into action a series of movements both direct and reflex, the importance of which can hardly be over estimated."

Concerning the vagus nucleus and roots, Dr. Dean, from his examination of this portion of the nervous system, concludes that three classes of nerve-fibres are contained in the medulla oblongata. He says, "It is a question of great interest to ascertain, if possible, whether, as is the case with the spinal roots, any of the vagus fibres are *directly* continuous with those of the hypoglossal, but it is extremely difficult to decide this point with accuracy. I have repeatedly thought that I could make out a direct continuity between single fibres from the anterior bundles of the vagus and some of the hypoglossal roots, especially those which turn backwards. Clarke seems to have traced a similar continuity between some of the fibres of the hypoglossal and spinal accessory nerves, stating that some of the fibres of the latter nerve 'may be traced even to the cells of the hypoglossal nucleus, where apparently they form loops of continuation with the fibres of the hypoglossal nerve.' If such be the truth, we have in the medulla three classes of nerve-fibres, analogous to those I pointed out formerly as existing in the spinal cord, viz.:

"1. Vagus (spinal accessory) and hypoglossal roots which arise from or terminate in cells in their respective nuclei.

"2. Vagus (spinal accessory) and hypoglossal roots meeting in cells.

"3. Vagus (spinal accessory) and hypoglossal roots directly continuous."

Dr. Dean's observations upon the histology of the olivary bodies in man are, in every important particular, in complete accordance with those of Clarke. According to Dr. Dean, the groups of very large cells from which the upper olivary bodies originate, are developed from the remains of the antero-lateral nuclei.—*American Journal of the Medical Sciences*, July, 1864, p. 205.

The Distribution of Nerves to the Skin of the Frog.—Dr. Ciaccio, of Naples, attributes the different conclusions arrived at by observers of the same object to their different methods of making preparations. On the present subject, the author says that he coloured the nuclei with carmine, and recommends that the vessels be injected with carmine solution according to Dr. Carter's formula, unless, to display the nuclei of the walls of the capillaries by subsequently soaking the preparation in carmine solutions, the contrast of Prussian blue is to be preferred. He concludes with the following inferences:

"1. In the skin of the frog are distributed two sorts of nerve-fibres—namely, the dark-bordered and the fine fibres, which run in the same sheath with them or with the capillary vessels.

"2. The dark-bordered fibres are so arranged as to form two networks; one is seated in the inner, and the other in the outer layer of the derma. These two networks are connected by intermediate bundles, or, in plainer terms, the originary bundles of the nervous network in the inner layer of the derma, after its formation, pass off, crossing the middle layer more or less obliquely, and when they arrive at the under surface of the outer layer of the derma, there they branch again and form a second network. Continuous with this second network there is an intricate plexus, composed only of fine bundles of pale fibres, which are partly prolongations of the dark-bordered fibres, and partly belong to the fine fibres imbedded in the sheath of the dark-bordered fibres. The very terminal portion of the plexus lies immediately beneath the capillary network of the outer layer of the derma.

"3. The fine nerve-fibres existing in the same sheath with the dark-bordered fibres, neither in refractive power nor in the manner in which they comport themselves with the chemical agents, nor in the appearances of those spindle-shaped swellings which they present at intervals, differ from the nerve-fibres accompanying the capillary vessels.

"4. The fine nerve-fibres running in the same sheath with the dark-bordered fibres are distributed to the capillaries, the connective-tissues, and the numerous glands which exist in the outer layer of the derma.

"5. No dark-bordered fibre is distributed to the middle layer of the derma. It is only supplied with fine bundles consisting wholly of the fine nerve-fibres which are contained in the same sheath with the dark-bordered fibres.

"6. The fine nerve-fibres accompanying the capillary vessels for the greater part arise from those imbedded in the sheath of the dark-bordered fibres.

"7. The fine nerve-fibres which are found in company with dark-bordered fibres at the periphery are not a prolongation of the latter. They are derived from ganglionic cells.

"8. Finally, in the skin of the frog, neither the dark-bordered fibres, nor the fine fibres in the sheath of the dark-bordered fibres, or in company with the capillary vessels, end in free extremities. They, always in their ultimate distribution, form networks or plexus, consisting of very fine bundles, connected at irregular distances with some small bodies of an oval, triangular, or some other shape."—*Quarterly Journal of Microscopical Science*, 1864, pp. 15–31.

Structure of the Cerebellum.—Dr. Luys contributes a lengthened paper, of which the following is an abstract:

"1. The cerebellum and its dependencies form a sub-system, very accurately isolated, in the general assemblage of the fibres of the nervous system. Isolated from the cerebro-spinal system properly so-called, but it is only by the intervention of the fibres of its peduncles that it enters into combination with it, and that it propagates its action to the grey substance of the corpora striata, &c.

"2. The fibres of the white substance of the cerebellum pass out of the grey cortical substance as clearly-defined filaments, and appear to be composed, after their origin (as to their fundamental elements), by the continual accession of prolongations of nerve-cells of differing nature.

"3. All the white cerebellar fibres, whatever may be their point of emergence, are directed as rays towards a mass of grey substance at the centre of each cerebellar hemisphere to reach the nerve-cells which are there. This mass of grey substance is related to the cerebellar fibres as the optic tract is to the white cerebral fibres.

"4. From this common centre of convergence soon pass forwards, and in three directions, a series of secondary fibres, true efferent conductors, which go to distribute themselves among the bundles of spinal ascending fibres, and thus, as they decrease little by little, become the origins of the grey peripheric substance of the cerebellum.

"5. All these efferent off-sets are intercrossed; they are distributed at the periphery in the region of the opposite side to that whence they set out.

"6. The lowermost efferent fibres, directed from above, below, and from behind forwards, take a spiral course through the spinal fibres, and are lost among the network of cells of the olivary body of the opposite side. The fibres which pass out of the olivary bodies appear to be distributed among the interstices of the surrounding spinal fibres. They contribute to the composition of the first networks of grey peripheric substance which appear at the level of the bulbous part.

"7. The middle efferent fibres are all more or less directed forward as curvilinear bundles, and are lost, after being divided into two principal parts, superficial and deep, almost entirely in the regions of the opposite side to that whence they originated. By their peripheric extremities they contribute to the formation of the grey substance of the protuberance.

"8. The superior efferent fibres pass, like their congeners, out of the cavity of the rhomboïdal bodies as clearly made-up bundles; they are lost, after being intercrossed among themselves, in two similar masses of grey substance on either side of the median line, and which, as to them, are related as the inferior peduncular fibres are to the olivary bodies.

"9. These superior olivary bodies, the texture and histological elements of which are quite comparable to those of the inferior olivary bodies, give off, in their turn, a series of secondary fibres which disperse in all directions. A first group of efferent fibres of the superior olivary bodies is distributed among the surrounding anterior spinal fibres. A second, principally from the outer parts of the superior olivary body, contributes, as excessively multiplied filaments, to the composition of a mass of grey substance, placed as a new fibrillary centre of irradiation, even in the midst of the half cone formed by the juxtaposition of the anterior spinal fibres spread out like a fan; this supplementary centre of irradiation of nerve-fibrils seems destined specially to enter into relation with the innermost spinal fibres. A third group, as a cylindroïd bundle, directed at first straight forward, then soon reflected on itself outwards, passes out of the most anterior portions of the grey substance of the superior olivary body, and is distributed principally amongst the ascending spinal fibres belonging to the bulbous and probably sub-bulbous regions.

"10. From the successive modifications which the peduncular fibres undergo, it results that when once they reach the last stage of their course, they thus become the origins of a true network of grey substance, continued from below upwards, from the bulbous region to that of the corpus striatum. These networks are made up, inferiorly, by the mutual anastomoses of the inferior peduncular fibres; at the protuberance, by the median peduncular fibres; and in the superior region, by the superior peduncular fibres, mediate or immediate. These different accumulations of grey substance appear to be, on the whole, associated in the vertical sense; they are composed of cells, generally endowed with homologous characters; almost all these cells are ovoid, of a peculiar yellowish colour; a certain number of them show very considerable pigment deposits, which give them, on the whole, a peculiar aspect. These successive collections of grey substance, distributed throughout the upper regions of the spinal axis, show well the proper sphere of activity of the cerebellum, to the heart of which is conducted, as in an arrangement of peripheric dissemination, the special influence to which it gives rise.

"11. The tracks of grey substance, belonging to the terminal expansions of the peduncular fibres, all affect, *and exclusively so*, excessively intimate relationship with the system of anterior spinal fibres. They first pass between the ascending spinal bundles and separate the bundles, then they mix with the groups of secondary fibres, which they thus successively disperse. Thus, by degrees they reach the primitive spinal fibre itself. Then the cerebellar fibre separates into its fundamental elements, its cylinder axis tapers, its sheath is prolonged as filaments, at the ends of which are found little characteristic cells, and this bundle of separated cerebellar elements embraces the continuity of the anterior spinal fibre (itself lessened in size and prepared to receive this supernumerary accession), and with it constitutes a true anatomical union, and even a single combination of two nerve elements previously isolated.

"12. This new combination which the cerebellar fibre contracts with the anterior spinal fibre, is the *characteristic* of the way of existence of the peduncular cerebellar fibres with the anterior spinal elements. The cerebellar fibre, once united with the spinal fibre, does not thus abandon it, but adheres to it like bindweed, and follows it till it reaches the great cells of the grey substance of the corpus striatum. There, in effect, one yet finds that the great cells which are to enter into relation with the anterior spinal fibres are covered on their walls with a series of little yellowish cells, of peculiar appearance, which are only a distant expansion of the peduncular cerebellar fibres. Thus they show a direct anatomical proof of the propagation of the action of the cerebellum (of which they represent the apparatus of peripheric dissemination) even to the great cells of the grey substance of the corpus striatum which thus mediately or immediately feel the influence of the cerebellar innervation."—*Robin's Journal de l'Anatomie et de la Physiologie*, May, 1864, pp. 225–266.

The Mucous Membrane of the Neck of the Uterus.—M. Cornil considers the normal condition of this membrane as an "introduction to the study of the neoplasies of the neck of the uterus, and particularly of the group of affections called *cancer*. He points out that "the mucous membrane of the neck of the uterus differs completely in structure and functions from that of the body of the uterus." He concludes, that "the viscous liquid of the neck is furnished by glands which are peculiar to it; that the epithelium of these glands is cylindrical, very long and slender in new-born infants; that it is shorter by a third or half in adult women, whilst it preserves its cylindrical form; that often in these latter it is reduced to nuclei; that in the cavity of the neck, the elements of this liquid undergo a series of regressive metamorphoses. In studying the contents of the ovula Nabothi, we soon discover that the epithelium of the glands may be changed even more, and assume the pavement, stellate and other forms." Further on he says, "The glands of the vaginal portion of the neck are like the simple glands of the intra-cavital portion. All these glands differ from those of the mucous membrane of the body of the uterus in that these last are simple follicles difficult to be seen well during the state of vacuity of the uterus, and remarkable by the changes which they undergo at the periods of menstruation and of gestation." A third division of this paper treats at length of the ovula Nabothi.—*Robin's Journal de l'Anatomie et de la Physiologie*, July, 1864, pp. 386–402.

On the Significance of the Yellow Spot.—Dr. C. Ritter, "from my own investigations," writes "that the fibres of the granular layer are finer, and do not combine in larger branches, as they do in the rest of the retina. In the retina of the other classes of animals" than those of man and the monkeys, "the centre is distinguished from the other parts by greater tenuity of fibres in the granular layer and in the limitans, by greater accumulation of smaller cells in the layer of the ganglia, and by thinning of the nerve fibre layer; all the outer layers show everywhere the same features.

"As regards the layer of the nerve-fibres, it entirely disappears in the macula lutea, whereas in the corresponding point of the retina of animals it is clearly distinguishable, although much thinner. The reasons for this are two-fold. In the first place, an extraordinary number of nerve-fibres end in the centre, the result of which is a marked attenuation of the layer; this is common to men and animals. Secondly, the other fibres bend in the form of arches round the macula lutea; this feature is peculiar to man. The reasons for this appear to me to be partly optical, as the retina of sharp-sighted animals—for instance, birds—is much thinner and much more transparent than that of man, and therefore needs no such special attenuation. It is just possible that there is also an optical reason for the fineness of the fibres of the limitans.

"All other peculiarities of the macula lutea either agree with the centres of the retina of animals, or vary from them. The agreement consists in the accumulation of the cells of the ganglia and the structure of the granular layer; the difference is to be found in the rods and in the granular layer. The layer of the rods in the centre of the macula consisting only of bulbs, and the number of these bulbs in the outer parts being greater than that of the rods, it follows of necessity that the inner granular layer which is connected with the bulbs must be greater than the outer one, which contains the granular layer of the rods. This accounts for the circumstances of the granular layers, if the reason for the accumulation of the bulbs is ascertained."

The author concludes: "The granular layer in the centre of the retina is thinner, and consists of finer fibres. The investigations which, in the course of my studies, I have made of the retina of the whale, have brought me to the conclusion that the granular layer consists of three kinds of fibres—1. The fibres of the limitans; 2. The branchings of the nerve-cells; 3. The processes of the rods and bulbs. The fibres of the limitans curve between the cells and form a beautiful network, the meshes of which become larger towards the ora serrata, but its framework is fine in the centre, but coarser near the ora serrata. In this network the processes of the rods, branching out in various directions, converge into greater branches, and finally form the branches of the cells properly so called. In the centre of the retina the processes of the rods run straight, combine rarely, and often end in initial breadth towards the cell; as they approach the ora serrata the processes run more obliquely, combine to a greater extent, and the branches of the cells become proportionately broader. This explains in a simple mode why the granular layer in the centre of the retina is narrower and consists of finer fibres. But the name of 'granular layer' for this layer is decidedly objectionable; in my opinion it is more appropriate to call it the outer fibrous layer in contradistinction to the nervous fibrous layer."—*Henle and Pfeuffer's Zeitschrift für rationelle Medicin*, 3rd Series, vol. xxi. part 3, p. 290.

Nature of the Red Blood-Corpuscle.—Dr. Beale in the first place points out the remarkable fact of the different crystallization of the colouring matter of the red blood-corpuscles, even in animals nearly allied, confirming their inherent specific differences. He believes that the red colouring matter of the blood-corpuscle was once in the condition of living germinal matter, having particular specific characters from different existing conditions and inherent powers, *vital power*. The colourless corpuscles and the colourless nuclei of the red corpuscles consist of matter in a living state. The various shapes of blood-corpuscles are due to their consistence and movements, and the action of fluids and gases upon them; they are not structural characteristics. Dr. Beale disproves the existence of a cell-wall to a red blood-corpuscle in various ways—that they sometimes change form without pressure, or portions are detached from them as if they were of a treacly consistence; that similar changes may be produced by a gentle heat—very fine threads are, as it were, drawn out from the red viscid matter; that if frog's, or other large, corpuscles are suddenly compressed, many will be subdivided into smaller ones, instantly spherical, without appearance of ruptured cell-wall or escape of contents; that a nucleus may pass completely through the coloured material; and finally, that the corpuscles of the blood of the guinea-pig soon break up into very small rounded portions, which show angles, and at last become distinct tetrahedral crystals. The whole of the soft, red, viscid matter of which the blood-corpuscle was composed, became crystalline. One corpuscle may form one crystal, or one large crystal may be formed out of several corpuscles. As this change occurs immediately blood is drawn, and seems to affect the youngest corpuscles, it is probably to be explained by the tendency to form processes which germinal matter often exhibits when stationary. When water is added to blood-corpuscles they swell, but they do not burst; they become very transparent, and doubtless a certain quantity of the fully formed colouring matter is dissolved out; but as the water evaporates, the corpuscles again assume their ordinary characters, many being only paler than before. . . . . The red corpuscle exists first as a very small spherical mass of transparent colourless germinal matter, which continues to grow for a time, and gradually undergoes conversion into the red colouring matter, &c.—*Quarterly Journal of Microscopical Science*, 1864, pp. 32–43.

Malpighian Tufts of the Kidney, having two Efferent Vessels.—Mr. B. Wells Richardson demonstrates that this does occur, though not very often; his observations in this matter differing from those of Bowman, and agreeing with the later results of Virchow and Beale.—*Dublin Medical Press*, vol. ix. p. 489.

Part II.—Pathological Micrology.

Mucous Polypus of the Stomach.—M. Cornil has reported two cases of this character. Both occurred in women. In the first recorded case, the mucous membrane of the stomach had the characters of chronic gastritis. The polypous projections were eight or ten, situated chiefly about the pylorus and the lesser curvature, varying in size from that of a hemp-seed to that of a bean, and having a wide or narrowed base. They were papillated, soft, reddish, and more or less injected. Their structure was examined in the fresh state, when dried and hardened in chromic acid. With a magnifying power of 220 diameters lengthened spaces were seen in them formed by a limiting membrane, containing pale nuclei, slightly granular, of ill-marked outline, and 0·005 to 0·006 mm. in diameter, generally rounded or oval, and placed in the midst of a finely-granular substance; they terminated at the periphery of the polypus, beneath the surface, by free, rounded, generally rather enlarged extremities. A good many of these villosities contained, besides the nuclei, fatty particles, refracting, yellow, and of 0·005 to 0·015 in size. As to larger cavities found in the largest of the polypi examined, they were formed of a limiting membrane, furnished on its interior with a single or double layer of cylinder epithelium. These epithelial cells were 0·045 long by 0·003 to 0·006 in width, parallel to each other, forming a continuous layer, having an elongated nucleus, surrounded on their free surface by a clear zone like the cells of the intestine, and not showing vibratile cilia. Lastly, in the interior of the cystic cavities was found a liquid containing epithelial cells become round and granular.

In the second case, on opening the abdomen, fine filaments of a peculiar pearly transparency, simple or branched, measuring from 1 to 5mm. in length were found in considerable number on the diaphragmatic peritoneum of the left side, and on all the serous surface of the stomach. Microscopically, they were the corpuscles of Vater, easily to be recognised by their concentric envelopes and their nervous filament. A good number were ramified at their free extremities. The mucous membrane of the stomach was thickened and papillated, and had scattered vascular arborisations and excavated spaces. At the junction of the right and middle thirds of this surface two projections appeared, one polypous, and the other with a broad base and its summit slightly depressed. The former was of the size of a large hazel-nut, and the latter of about a centimetre in diameter. A close inspection of the mucous membrane in their neighbourhood and above the pylorus showed little villous projections, more or less elongated, and especially well marked on the pedicle of the polypus. Vertical sections of the mucous membrane, magnified forty diameters, showed the glandular tubes of the stomach of their normal size and contents; but the periphery of their orifices in the stomach was set thick with villosities more or less long; sometimes the periphery of the orifice was only hypertrophied and more prominent than in the normal state; at others this hypertrophy had resulted in the formation of villosities reaching in length to a millimetre. They were also more numerous, larger, and nearer to one another, in the neighbourhood of the above-mentioned little tumours. On vertical sections of the non-pediculated tumour these villous productions formed a superficial layer, where they were adherent to one another at their deeper parts, free only at their summits, so that one could no longer distinguish the orifices of the glands. Beneath this layer the glands of the mucous membrane were themselves hypertrophied and changed in appearance. Sometimes they appeared of an elongated form, but nearly all were transformed into little rounded cavities, lined by their spherical or polyhedral epithelium. These two layers, papillary and glandular, formed the greater part of the tumour of which the deep layer was formed, by the hypertrophy of the sub-mucous cellular tissue. The pediculated tumour, examined with low powers on vertical sections, showed simply spaces generally rounded, glandular, lined by an epithelium, and surrounded by a very rich vascular plexus. The superficial papillary layer had almost everywhere disappeared. The vessels increased in size and diminished in number from the superficies of the polypus to the pedicle, at the centre of which one found only an artery and a vein. The villosities, examined with stronger powers, never seemed to possess vessels: it is true that, to be certain of their non-existence, it would have been necessary to have injected the arteries of the stomach. These villosities were from 0·040 to 0·075 in width. They had a limiting membrane, double contoured, as could be seen very distinctly in some cases. Their tissue was a dense fundamental substance, containing a great number of nuclei, very close together, and of 0·006 in their greatest length. These productions, which in our first communication we were led to regard as reversed glands, were full and without central light, of which we were assured by making delicate perpendicular sections in the direction of their length. The glandular spaces of the polypus measured about 0·09 to 0·15 in their greatest diameter; they were rounded or oblong, mutually compressed, and separated by scanty areolar tissue, which served as a medium for the vessels. Their enveloping membrane was thick, double contoured; the contained cells formed a layer near their wall. These cells were rounded, or somewhat polyhedral, of 0·006 to 0·009. One saw besides this parietal layer, cells free in the centre of the acinus, and more or less granular. To sum up, one saw that in the left half of the stomach there were villosities at the periphery of the orifice of the glands—a constant phenomenon in some animals, but very rare in man, and attributed by Rokitansky to catarrhal gastritis. The projecting tumours presented in their structure a superficial layer of villosities united to each other, without any trace of an excretory duct, by a deep layer formed by the hypertrophy of the changed glands into little closed cavities. We believe we can further say that, from the study of one of these tumours, the hypertrophy of the villosities, and their adherence to each other, had caused the obliteration of the ducts and the hypertrophy of the glandular culs-de-sac.—*Gazette Médicale de Paris*, Jan. 23, 1864, pp. 58-9.

Expectoration in different Diseases.—Dr. H. Chatin, of Lyons, in his recent work on this subject, describes its microscopical characteristics. He says: "We have observed the morphological elements of expectoration in the different diseases of the respiratory apparatus, and with certainty the presence of pus or blood—also traces of organized tissues. Further researches have shown us the *débris* of morbid tissues separated by the disease, cells and the remains of cells cast off, the quality of the morphological elements, the relation existing between the cells and the unorganized elements of the secretion, the relative quantity of blood globules, epithelial cells, and mucous corpuscles." The author, like Biermer, divides the elements of expectoration into two categories. First. The following morphological components: Epithelial cells—blood globules—pus and mucous globules—the tissues of the respiratory organs—crystals—entozoa—albumino-fibrinous products—hairs—remains of food and foreign bodies. Second. The amorphous and chemical elements, viz.:—Proteine—derivatives of proteine—sugar—fat—colouring matters, and water. He says: "The examination of matters expectorated and consequent upon the incessant exfoliation of the diseased epithelium may indicate either simple bronchitis, or capillary bronchitis, or hyper-secretion from the bronchi. The transformation of clear into opaque expectoration shows simple chronic bronchitis, or the third period of capillary bronchitis, and in some cases tuberculization; then, above all, we may discover the presence of remains of pulmonary tissue, and especially of elastic fibres. "In order more easily to find these fibres," he says, "several expectorations must be mixed with a certain quantity of water in a stoppered bottle, then shake the whole to separate the denser parts, which fall to the bottom of the water, and which should be investigated. Biermer does not admit of the production of elastic fibres in so constant a manner in tubercular softening. Remak and other pathologists have admitted their constant appearance after the second period of the disease. This sign has been valuable to establish the diagnosis of the tubercular affection at the time of softening, in the cases in which the other rational and stethoscopic signs are wanting. We think that the value of this sign has been much exaggerated; in fact, elastic fibre is found in the expectoration of chest affections which have only a distant resemblance to true tubercular phthisis. Thus we have found it in chronic ulcerous pneumonia, in vomica, and often, in old people, in lobular pneumonia."—*L'Union Médicale*, June 30, 1864.

On the Atrophic Fatty Paralysis of Infancy.—Dr. Duchenne, jun., of Boulogne, is publishing a series of articles on this subject. He marks four stages in the progress of the fatty change in the muscles—1st. Simple atrophy of the muscles, diminution of their volume without change of striation. 2nd. Disappearance of the transverse striations, and afterwards of the longitudinal fibres. 3rd. Production of amorphous granules. 4th. Transformation of the amorphous granules into fatty vesicles. Microscopically he thus describes the four stages—1st. There is not yet any change in the proper muscular elements, which are perfectly striated, but, in part, the muscular fibres appear diminished in volume, and some are three or four times smaller than in the normal state. 2nd. The transverse striæ are less apparent, frequently interrupted, and the longitudinal fibres are more plainly seen than in the normal state; the muscle becomes pale and takes on a fibrous appearance, and later still the transverse striæ disappear, and the longitudinal fibres afterwards become invisible. 3rd. Amorphous granules, which fill the fibrous envelopes of the muscle, are produced. 4th. Fatty change, which invades not only the muscular fibres, occupies also all the intra-fibrous spaces; the amorphous granules have then disappeared entirely; the muscular mass has a yellowish-white colour, its cylinders contain only granules and fatty vesicles. Nevertheless, in this homogeneous mass, one can yet see little thread-like lines, isolated, without apparent communication with others of the same kind, in length some millimetres to a centimetre, and of a pale rose colour. These parts are easily seen to be muscular tissue which has preserved its striation and its anatomical elements.—*Archives Générales de Médecine*, August, 1864, p. 184.

Miscellaneous.

Pus and Connective Tissue Corpuscles.—Dr. F. v. Recklinghausen, in the work now published by him, draws attention to a peculiarity of an animal cell, hitherto little noticed; viz., a kind of active mobility in them, as the author has often observed, in pus corpuscles. If by cauterization of the cornea of a frog an inflammatory cloudiness is produced in it, the aqueous humour simultaneously also assumes a kind of turbidity. This turbidity is caused by pus-corpuscles, but we soon find out that these pus-corpuscles have not their usual round form, but protrude dentations of various length, number, and shape. But the striking peculiarity consists in this, that each corpuscle constantly changes its form. At the circumference of the pus corpuscle there appear fine filiform processes which shoot out singly and in groups, become thicker at their base, and absorb a portion of the substance of the cell body. Some of these processes recede and disappear altogether. Sometimes such processes show themselves in the whole circumference of the pus corpuscle, to twenty in number; at other times a bundle of three to six such processes appears at different spots of the cellular circumference. The single offshoots of the corpuscles may branch off again, combine again in a reticular form, and then converge into a broad mass. But such a fusion never ensues but of those filiform offshoots which are close together, whereas offshoots of the other parts of the surface soon recede into the body of the pus corpuscle. Through this the corpuscle, which was originally rotund, assumes a different shape, often a star-shape, when a greater mass of the substance of the cell-body protrudes to the fused processes, and the much narrowed cell-body itself forms the nucleus of the star.

In the fresh condition of the moveable corpuscle no particular elements are discoverable. But they contain nuclei, that may be shown by re-agents, as well as small fat and pigment granules, which demonstrably change their position with the movement of the cell. When the aqueous humour in which the corpuscles are suspended is subjected to re-agents, the cells lose their mobility, they assume a more rotund shape, and the nuclei are clearly distinguishable. The sensitiveness to re-agents proves that the cause of the metamorphosis of the pus corpuscles must rest in themselves. Consequently they have the same contractility as the lymph corpuscles and pigment-cells of the frog have been found to possess.

The author has investigated fresh human pus, which he diluted with some natural transudation, or with a two or three per cent. saccharine solution, or one and a half to two per cent. solution of common salt, and similar liquids. It appeared that the pus corpuscles from fresh pustules underwent lively changes of form, and in this respect resembled the pus corpuscles of the frog. The catarrhal secretion of inflamed mucous membranes also, and the pus of granulations, contained motile pus corpuscles; but, in proportion as the inflammation was fresh and acute, were the changes of form more lively. Under unfavourable exterior influences the changeableness of form in the pus corpuscles of man becomes extinct, the corpuscles become rotund, and generally assume those peculiarities which are commonly attributed to them. In the fresh condition of the human pus-corpuscle there is, besides the change of form, also a very lively molecular movement in the interior of the cells distinguishable, which movement becomes more active at those points where the processes protrude from the cell. The author could also certify, in the pus-corpuscles of a dog and of a rabbit, active changes of form, and feels justified in saying that the pus and mucus corpuscles of vertebrata, at least during a certain period of their lives, possess contractile qualities, which are attested by the change of form and the so-called molecular movement.

But the pus corpuscles not only change their form when they are in a liquid medium, but also when they are enclosed in solid tissue, as we can clearly see if we bring the inflamed cornea of a frog, without pressure, under the microscope. Highly important is the fact, *that the pus-corpuscles move in consequence of their metamorphosis.* The mass of the cells protrudes to the processes which issued from the cell body, the rounded end of the pus-corpuscle which is opposite the process advances towards the point of the process, and the latter extends more and more, &c. The direction which the pus-corpuscles take in their migration is generally a sharp curve.

If one removes a thin piece of the healthy cornea of the frog, putting it with some aqueous humour under the microscope, so that the membrane of Descemet is uppermost, so that the aqueous humour cannot evaporate, and so that the preparation is not pressed upon, then, after a few minutes, the movement of corpuscles can be perceived which appear identical with the pus-corpuscles which change their shape. The mode in which these corpuscles move in the cornea shows that spaces exist in the substance of the cornea, with fluid contents, in which the corpuscles move about. These spaces cannot be produced by the action of the corpuscles since their movements are too quick, and they must therefore have existed before. We cannot directly perceive these spaces on account of the index of refraction of the fluid contained in them being the same with that of the substance of the cornea. These spaces seem to be cylindrical where they are narrowest, since the corpuscles possess nearly equal thickness and width. But at some places these invisible canals must be either very elastic or change into wider spaces, since the moving corpuscles in some places change into a somewhat opaque broad mass. The system of canals and large spaces, not visible when the cornea is fresh, seems, according to present observations, to communicate with the lacunæ in the substance of the cornea, which lacunæ are occupied by the star-shaped moveable corpuscles of the cornea.

That we may consider these corpuscles as the normal inhabitants of the cornea of the frog, can be inferred from their never being absent; that their movements also occur in the healthy living body seems probable, because in the tail of the living tadpole the same corpuscles are also observed. The author has also in the cornea of different mammals seen such corpuscles, which continually change their shape, and by means of this change of shape move on. The author also observed similar corpuscles in other connective tissue parts of mammals.—*Schmidt's Jahrbücher*, 1864, vol. cxxiii. No. 2, p. 158.

HALF-YEARLY REPORT ON TOXICOLOGY, FORENSIC MEDICINE, AND HYGIENE.

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I. Toxicology.

On Digitaline as Poison.—The trial and execution of De Pommerais for the assumed poisoning of Madame de Pauw by digitaline, has naturally given rise to various researches on this alkaloïd. We have before us many papers on this subject, from which we may cull one or two facts. We regret, however, to observe that, although an immense number of experiments have been performed, no corresponding improvements or discoveries have been made. It should first be recalled that MM. Tardieu and Roussin, in their report on the Pommerais' case, drew the following conclusions:

(*a*) That Madame de Pauw died of poison, and that the poison was one of those derived from the vegetable kingdom, which leaves no traces of its action on the body, and cannot be detected by chemical analyses.

(*b*) That they had obtained from the matters vomited by Madame de Pauw and from the organs of her body a very energetic poisonous principle, which produced in animals symptoms similar to those from which she herself had suffered, and caused death after the same manner.

(*c*) That the symptoms thus induced were found on experiment to be very similar to those that were induced by digitaline.

(*d*) That without absolutely proving it as a fact, they had good reason to affirm that Madame de Pauw died from poisoning by digitaline.

The experiments by which the experts named were led to arrive at the above conclusions were almost purely physiological. They found no tests of a chemical kind that were reliable. They conducted their inquiries, therefore, by making an alcoholic extract of the stomach and intestines of the deceased woman, and of the vomited matters scraped from the floor of her room. This extract they administered to various animals, sometimes by injection under the skin, sometimes by the mouth. Five grammes of the alcoholic extract made of the vomited matters scraped up from the floor were introduced into incisions made in the inner part of the thighs of a large healthy dog. For nearly two hours and a half no symptoms set in; then the animal commenced to vomit, and the pulse, which had fallen from 110 to 94, was irregular and intermittent. The breathing was somewhat hurried, and also intermittent. An hour later the pulse had fallen to 76, and the animal had again vomited. In three hours and a half more the animal laid down, much prostrated, any movement seeming to excite vomiting, and the heart being still irregular. Twelve hours later the animal was almost cold; the heart's beat had fallen to 40, and was still intermittent. The breathing was hurried and irregular. Death took place three hours later still, almost without pain, and apparently with consciousness to the end. The post-mortem showed a healthy condition of the lungs, stomach, liver, and brain. The heart was much changed; the auricles were dilated, while the ventricles were remarkably contracted. All the cavities were full of partially coagulated dark blood. The organ itself was congested, especially towards the apex.

In another experiment the same extract was administered, in a dose of two grammes, to a rabbit by the mouth. Death took place in two hours and three-quarters; the symptoms and post-mortem appearances were very similar to those observed in the previous case of the dog.

Experiments were next made on frogs with digitaline itself and with the alcoholic extract of the vomited matters. These were often repeated, and the conclusion arrived at was that the effects on the heart of the two poisons were almost parallel. The authors give a table in which the results of this experiment are placed side by side.

In another experiment on a dog, an extract got from the stomach and the intestines of Madame de Pauw was introduced into incised wounds; the symptoms that ensued were analogous to those observed in the first experiment, but the animal, after many hours' illness, recovered.

The symptoms revealed by these experiments were compared with those which had been presented by Madame de Pauw, and were considered to coincide. The day before death she had been well. The first symptoms she evidenced on the night before her death consisted of violent vomiting and extreme prostration. Dr. Blachez, who saw her in her last moments, remarked that she was pale, much agitated, bathed in a cold sweat, and complaining of an insupportable headache. Her pulse was irregular, intermittent, and almost imperceptible, and the beat of the heart was tumultuous and irregular. The symptoms resembled those common to a rapid internal hæmorrhage.

We need hardly state, for nearly everyone must know the fact, that on this scientific evidence De Pommerais was convicted of having poisoned Madame de Pauw with digitaline, and was executed for the assumed crime.

Dialysis has been applied to the detection of digitaline by M. Grandeau. He has laid before the Academy of Sciences, through M. Bernard, a paper in which he records certain experiments which he has made in dialysis with morphia, brucia, and digitaline. He placed in the dialyser distilled water, having in solution one ten-thousandth part of pure digitaline. After twenty-four hours, on evaporating the water in the exterior vessel, he found exactly the same quantity of a substance having all the properties of digitaline. The fluid in the dialyser left no residuum on evaporation. Wine containing about a four-thousand-five-hundredth part of digitaline was next placed in the dialyser. After eighteen hours the exterior fluid was evaporated, and alcohol added. The alcoholic extract obtained was in turn evaporated, and a residue was obtained possessing all the characters of digitaline. Some digitaline was also found in the dialyser. The stomach and intestines of a dog were removed some hours after death, and macerated in water at 80° Fahr. From this there was filtered a yellowish, odorous fluid. The fluid was divided into four equal parts. To one was added the six-thousandth two hundred and fiftieth part of digitaline, to another the twelve-thousandth five hundredth part of brucia, and to the third the same quantity of hydrochlorate of morphia. The fourth was left untouched. All these parts were subjected to dialysis for twenty-four hours. Brucia, morphia, and digitaline were each found in the exterior fluid of their respective vessels, and were distinguished by the colour-tests. No reaction was given from the fluid that had been left alone.

M. Grandeau has endeavoured to obtain a reliable colour-test for digitaline. Hitherto the only test known has been the green colour developed by adding concentrated hydrochloric acid to the alkaloïd—a process by no means satisfactory, as many alkaloïds give a green colour with this acid. The successive action of sulphuric acid and the vapour of bromine appear so far to characterize digitaline even in minute quantities. On bringing pure digitaline in contact with pure sulphuric acid, a colour of sienna-brown is exhibited, which after some time passes to a wine-red; the addition of water turns the colour at once to a dirty green. When the residue of a few drops of a dilute solution of digitaline is treated by sulphuric acid, the colour produced is a more or less deep brown-red, and in very small quantities it is rose colour, the colour of the flower of digitalis. Again, when the digitaline that has been treated with sulphuric acid is exposed to the vapour of bromine, a more or less deep violet colour is produced.

M. Grandeau does not find the same reactions with a number of other alkaloïds on which he has experimented—viz., morphia, narcotine, codeia, narceine, strychnia, brucia, atropine, solanine, salicine, santonine, veratrine, phloridzine, daturine, amygdaline, asparagine, cantharidine, and caffeine. He therefore thinks the tests he has given are fair and satisfactory.

M. Lefort in a communication to the Academy, claims priority in observing that digitalis will pass through the membrane of the dialyser. He assumes that there are two kinds of digitaline—one which is soluble, and which comes from Germany; another which is insoluble, made by the process of Homolle and Quevenne. Both give a green colour with hydrochloric acid, especially the French sample. Hydrochloric acid in form of gas turns the French digitaline of a dark-green colour, and develops the special odour of the leaves of digitalis: the same gas turns the German sample of a dark-brown colour, and develops the odour but very slightly. Both specimens pass through the dialyser. M. Lefort thinks that the bitter taste of both kinds of digitaline, their coloration by hydrochloric acid, and the development of the odour of the leaves of digitalis on exposure to hydrochloric acid gas, are sufficient tests to denote the presence of digitaline.—*For the paper of MM. Tardien and Roussin, see Annales d'Hygiène Publique,* July, 1864; *for the paper of M. Grandeau, see Comptes Rendus,* June 6th, 1864; *and for the paper of M. Lefort, Comptes Rendus,* June 13th, 1864.

Poisoning by the Calabar Bean.—Mr. J. Baker Edwards, of Liverpool, has drawn up a very comprehensive and able report on the effects of the Calabar bean taken in a poisonous and fatal dose. The following is the summary of his labours:—

History of Cases.—"1. About seventy children were poisoned by eating the beans, of whom about fifty were treated at the Southern Hospital in Liverpool. The quantity taken by each child was from half a bean to six beans. The nuts were cracked, and the kernel eaten without the spermoderm.

"2. The children were mostly under ten years of age, and the poison generally produced nausea and vomiting in half an hour. The secondary symptoms, trembling, dizziness, and loss of power in the limbs came on within an hour of administration. Within three-quarters of an hour to one hour after eating, the children were brought to the hospital, and at once treated with emetics. In the one case which proved fatal, the emetics (sulphate of zinc and mustard water) failed to act, and the child died by syncope within a quarter of an hour of his admission. He was said to have eaten four beans.

"3. The organs of the body were found healthy, except some tuberculous disease in the lungs. The blood was very fluid. The heart contained fluid blood and clot in all the four cavities, indicating death by paralysis of the muscles of the heart. Although there was no reddening of the coats of the intestines, there had been purging, which had removed the fæcal matter, leaving only in the intestines a whitish, semi-fluid emulsion of the seed. The bladder was perfectly empty and contracted. There was really nothing in the post-mortem appearances to indicate the cause of death, except the peculiar contents of the intestines, and had these been removed by purging there would have been nothing to distinguish between death by this poison and death by cholera. From my chemical analysis I should also infer that although in this instance circumstances favoured the detection of the poison in the intestines after death, yet in a minimum fatal dose, or a prolonged purging before death, nothing would be found in the body to identify the poison or to account for death.

"*Analysis.*—I proceeded to make an alcoholic extract of the beans, also of the contents of deceased's stomach, and of the contents of deceased's intestines. The stomach contained only five ounces of fluid, consisting of a few fragments of the bean and the remains of a mustard emulsion which had been administered shortly before death. The quantity of alcoholic extract of the stomach was therefore very small, and its reactions were obscured by the mustard. After further purification by ether, an extract was obtained which caused marked contraction of the pupil in the eye of a rabbit when applied to it externally. From the intestines of deceased I obtained seventeen fluid ounces of an emulsive fluid, which, after digestion with the alcohol, yielded an extract, which was then purified by ether and evaporated. This ethereal extract corresponded in its reactions with a similarly-prepared extract of the leaves under examination. The chemical reactions on a watery solution of the ethereal extract are as follows: 1. A pink colour, struck by caustic potash, which gradually increases in intensity to a deep red, and when mixed with chloroform forms a deep red chloroformic solution, which separates from the clear yellowish supernatant liquor. 2. A red colour, struck by strong sulphuric acid with separation of a resinoïd coagulum. 3. A violet colour, changing to red by sulphuric acid and crystals of bichromate of potash. 4. A similar colour, with sulphuric acid and binoxide of manganese, retaining the purple colour for a long time. 5. A yellow precipitate, with solution of iodine in iodide of potassium. 6. A purple colour, with terchloride of gold and reduction of metallic gold. 7. A yellow colour, struck with caustic ammonia, which, exposed for some hours to light, turned green, and finally a deep blue. I applied a few drops of the aqueous emulsion of this ethereal extract obtained from the intestines of deceased to a frog's back, by insertion under the skin. In a short time the animal manifested an indisposition to movement, and became very quiet. In the course of an hour it became unable to jump or to remove the position in which its limbs were placed, and in about two hours it became perfectly flaccid and insensible to any external irritation. Although stimulated by strychnine, it was incapable of being roused to muscular exertion, and soon expired, having previously exhibited very irregular respiration and pulsation. A second portion of the emulsion was exhibited to a mouse, which became soon paralyzed in its limbs, and died after a few hours. A third portion was introduced into the circulation of a mouse by the ear, and after twenty-four hours the poison operated fatally, by complete paralysis of the limbs and senses, and the animal died by syncope. A fourth portion of the emulsion from the intestines of deceased, applied to the eye of a rabbit, caused strong contraction of the pupil after three-quarters of an hour. Similar results were obtained by an ethereal extract of the bean itself.

"*Conclusions.*—1. The bean is edible in poisonous quantities, and although slightly rough in its flavour, does not appear to excite disgust or alarm when eaten alone, and would be undiscovered when mixed with food.

"2. The symptoms are not always immediate, nor is vomiting induced, except when the dose is excessive; nor would the secondary symptoms—viz., dizziness, faintness, and loss of power in the limbs—excite sufficient alarm to call for medical assistance until life was really in immediate danger.

"3. The symptoms would scarcely be distinguished from sudden indigestion or English cholera in time to save the life of the patient.

"4. In criminal cases, nothing might be detected by the autopsy or by chemical analysis to reveal the cause of death.

"5. So insidious a poison should not only be stored, but also handled with great caution, its alcoholic solutions or extractive, when introduced into the circulation, acting as a slow but certain poison, leaving no trace in the body which can be identified by chemical tests in our present knowledge of the poison."—*Pharmaceutical Journal*, September, 1864.

Poisoning by Tobacco-leaves externally applied.—M. Bernard related to the Academy of Sciences on July 11th, on behalf of M. Namias, the case of a man who some months before enveloped his whole skin in tobacco-leaf, for the purpose of evading the payment of duty. The tobacco, softened by the perspiration, produced true poisoning. Under the use of alcohol and laudanum, the patient recovered. He had an extremely weak, small pulse, cold sweats, and general prostration, during the time he was under the influence of the poison. M. Namias thought there was no other case on record in which poisoning by tobacco has occurred through absorption by the skin.

At a subsequent meeting of the Academy, as bearing upon the above communication, M. Gallavardin sent in a paper, in which he adduced several cases of poisoning by the external application of the leaves of tobacco. He reports that in 1801 a whole squadron of cavalry covered their bodies with tobacco-leaves, for the purpose of smuggling these leaves across the frontier; and all suffered from vertigo, headache, and sickness. This instance is related by Von Hildebrand, in Hufeland's Journal, vol. xiii. In 1844, a woman fifty years old, after the external application of tobacco-leaves, suffered from nausea, spasmodic vomiting, hiccup, oppression of breathing, attacks of suffocation, prostration, coldness of the extremities, cold, clammy sweats, and slow and intermittent pulse. This case is recorded by De Meyern in the Prussian

'Medicinische Zeitung,' No. 8, for 1844. In a third case, in which dried tobacco-leaves with honey were applied to the limbs of a robust peasant, aged thirty-seven years, who was suffering from chronic rheumatism, the following symptoms were observed :—Headache, congestion of the face, vertigo, trembling of the limbs, nausea, vomiting, a small and slightly-accelerated pulse. This case is published by M. Polk in the same journal for 1854, No. 52.

Symptoms of tobacco-poisoning have also been observed after the application of tobacco-juice to a chronic eruption on the neck (Lauderer); after the external application of tobacco (Truchsess); by frictions made with the residue left after smoking tobacco on parts denuded of skin (Westrumb); after the employment of tobacco-juice to an ulcerated surface (Walterhall); after the application of tobacco in powder to a wound in the thigh (Keskring); after the application of an ointment made up of tobacco and butter to three children with scald heads (Kerkring); after enveloping the arms, hands, thighs, and hams with linen dipped in a very hot strong decoction of tobacco (Marrigues).

From these observations, M. Gallavardin concludes that, without doubt, tobacco applied to the skin, whether abraded or not, may poison the body. The great value of his paper lies in its historical character, and in the correction it supplies of the suggestion by M. Namias, that his case was unique.—*Comptes Rendus*, July 11th and August 1st, 1864.

A Case of Poisoning by Chloroform, in which the Narcotic was swallowed.—At the meeting of the Medical Society of Victoria, held on Wednesday, March 2nd, 1864, Dr. Dowling reported the following case :

"At about 2 A.M. on the morning of February 16th, 1864, Robert Kellmar, a German barber, aged twenty-eight, was brought here in a state of insensibility, and reported to have swallowed some chloroform. An ounce and a half phial was shown me, which smelt of chloroform, and it was believed he had taken the whole ounce and a half. His mouth smelt of chloroform. The surface of the body was cold and clammy; breathing slow and stertorous; pulse small and fast failing; eyes fixed towards the upper and inner angle; pupils dilated and insensible. I immediately washed out his stomach with the pump. What was drawn out smelt somewhat, but not strongly, of chloroform. After this, the breathing became more natural, and the pulse began to rise. He was now taken to a ward and put to bed; cold was applied to his head, hot bottles to his feet, and he was carefully watched. In about an hour he came to, indicated by his turning and twisting in bed, and moaning as if in pain. As his senses returned, his cries of pain increased, and when I visited him in the morning I made the following note :—Complains of severe pain about the region of the stomach and spleen, which he says has been going on for the last week, and it was for the relief of this that he took the chloroform. (The evidence at the inquest shows this to have been false, and that the poison was taken with a direct suicidal intent, during mental depression, following losses by gambling. The pain was, however, a reality at the time I made the notes.) He has also some oppression of breathing. On examination of his chest with the stethoscope, I find his heart's sounds feeble, but otherwise normal. There is moist crepitation over both lungs, and the respiration appears embarrassed. Great tenderness over the stomach and spleen. I ordered him some carbonate of soda with morphia every four hours. After taking two or three doses of this, his pain abated, but the respiration continued embarrassed, and as night came on he began to expectorate mucus, some of it tinged with blood. Matters continued thus through the night. As morning came on, the pain about the stomach increased, and he died somewhat suddenly just before 9 A.M. on the 17th.

"*Post-mortem Examination at* 6 P.M.—Body well developed, but fat and heavy. There are the marks of old venereal nodes on the left tibia. On removing the skull-cap, the membranes and substance of the brain are seen to be much congested; but there is no unusual serous effusion. The lungs are both considerably congested throughout, most so at the lower parts. The heart is what would be spoken of in general terms as natural. The muscular tissue appears on section to be too pale to the naked eye; it was not further examined microscopically. The right cavities contain some semifluid black blood; the left side is empty. The liver is very large, pale, and friable. Mucous membrane of the stomach and duodenum much congested. Spleen hyperæmic; it feels too soft when torn across. Kidneys apparently healthy, except being intensely congested."

In commenting on the above, Dr. Dowling says: "Now, how shall we explain the death? The congestion of the lungs was not such as necessarily would cause death of itself, neither was that of the stomach, spleen, kidneys, or brain. Then there is the fatty heart, which we are always somewhat apt to fall back upon to help us out of our difficulties. Though I do not see that any one of these organic conditions separately gives sufficient evidence of the cause of death, yet the aggregate, taken in conjunction with the fact that the vital powers were depressed considerably below par by his dissipated life, and the dose of chloroform, will, I think, make up the requisite cause.

"In determining the import of these post-mortem appearances, we have but little to guide us. There are but few cases recorded; and on the other hand, we are puzzled by the fact that large quantities of chloroform have been swallowed, and no ill consequences have ensued. It is well known that, for some years past, Dr. Corrigan and others, in Dublin, have been in the habit of giving chloroform for delirium tremens, in doses of from one to three drachms every two or three hours, until the patient gets to sleep. A case is reported as having occurred in the practice of Mr. Jackson, of Sheffield, in which a man swallowed four ounces of chloroform. He walked a considerable distance afterwards, but subsequently fell into a state of coma, with convulsions. He recovered in five days. Again, Mr. Thursfield, of Brosely, reports a case of a boy of four years old, who swallowed one drachm of chloroform. He became insensible, but lived for three hours, and notwithstanding all the proper means were used for his recovery, he then died quite tranquilly. There is no account of a post-mortem examination in this case.

"The deduction from a consideration of the case appears to be, that the danger of death from the presence of chloroform in the blood is not limited to its duration there, but that death may ensue subsequently, after all immediate danger is past, as the result of organic changes caused by the chloroform during its actual presence, and in the process of elimination.

"An unusual case of death some hours after the inhalation of chloroform came under my notice when I was house surgeon at the Manchester Infirmary. A man subject to asthma took chloroform, preparatory to the removal of a piece of dead bone from the tibia. The operation was a short one, and the man recovered as usual. This was about mid-day. At about 6 P.M. an attack of spasmodic asthma came on, which was quite unaffected by remedies. Such great general venous congestion quickly appeared, that I bled him at once to about six ounces. No effect seemed to be produced, and I therefore desisted. His symptoms continued, and he died, literally of asphyxia, in less than an hour from the commencement of the attack."—*The Australian Medical Journal*, April, 1864.

On the Effects of Absinthe.—M. E. Decaisne has presented a memoir to the Academy of Sciences on absinthe, in which he arrives at the following conclusions:—

1. Absinthe, in the same dose and of the same degree of alcoholic concen-

tration as brandy, produces more disastrous and more strongly marked effects on the economy.

2. In an equal dose absinthe produces intoxication much more rapidly than brandy. The conditions that have been described under the names of acute and chronic alcoholism are much more readily developed under its influence. It must, however, not be forgotten that the amount of alcohol in absinthe is generally very great.

3. The effects of absinthe on the nervous system are more marked than those of brandy, and closely resemble the effects caused by a narcotic acid poison.

4. One of the greatest dangers of absinthe consists in the adulterations to which it is subjected.

5. Absinthe of good quality, in moderate doses (a glass or two daily), is never unattended by danger, and always produces in time disorder, especially of the digestive functions.

6. Finally, absinthe ought to be entirely banished as an article of consumption.—*Comptes Rendus*, August 1, 1864.

Poisonous Properties of Essence of Absinthe.—It has been stated by many writers that there is a poisonous principle in the officinal absinthium. This opinion has not been fully accepted, but there can now no longer be any different opinion on this subject. M. Marcé has laid before the Academy of Sciences a communication, which seems to prove positively the existence of such a poison. A series of experiments on dogs and rabbits, which animals were made to take by the mouth the essence of wormwood, showed that this plant possesses poisonous properties. The essence in doses of two or three grammes produces in these animals trembling, stupor, sluggishness, insensibility, and all the signs of great terror. In doses of from three to eight grammes it produces clonic epileptiform convulsions, with involuntary evacuations, foaming at the mouth, and stertorous breathing. These symptoms are transient, and do not lead to death. These results prove, according to M. Marcé, that the liquor known as "absinthe" has a double toxicological action on those who take it in excess—viz., the action of the alcohol and that of the essence of the wormwood; the latter being characterized by stupor, sluggishness, terrific hallucination, and intellectual weakness setting in with great rapidity. According to the same author, the liquor sold as absinthe contains about five drachms of essence of absinthium in one hundred quarts of alcohol. —*Bulletin Génèrale Therapeutique*, May 15, 1864.

Poisonous Effects of Aniline on Workmen employed in its Manufacture.—Dr. Kreuser, of Stuttgard, has observed several cases of intense bronchitis characterized by violent dry spasmodic cough, accompanied by ulcers, seated principally on the lower extremities and the scrotum. These ulcers were round, had well-defined and often callous edges; were covered with thick blackish crusts lying on a dirty grey base, while the parts around were swollen and painful. All the cases were easily cured under simple treatment, so soon as the patients were removed from the vapours developed in the manufacture of aniline. By protecting the skin with proper clothing, by inducing to practise ablution, and by improving the ventilation of the manufactory, the peculiar form of bronchitis seems to be removed, except when the wind takes a certain direction. The existence of this special disorder has also been observed by Stadler of Marburg and Stœrig of Wildungen.—*Corresp. Blatt für Gemein.* July, 1864.

II. Forensic Medicine.

Suicide in the Vienna Garrison.—Professor Engel has collated the statistics of suicide effected in the Vienna garrison during the four years 1859-62, both included. In the short period named no less than seventy-five persons have destroyed themselves in this one garrison, averaging from 20,000 to 25,000 men.

Of the seventy-five suicides, thirty four were Austrian Germans—viz., eleven Viennese, ten from other parts of Lower Austria, two Tyrolese, two Styrians, one German Hungarian, and eight German Hanoverians. There were also twelve Bohemians, ten Gallicians, three Servians, one Sclavonian, six Hungarian Magyars, one Transylvanian Magyar, four Italians and one Wallachian, one Bavarian, one Hessian, and one Rhenish Prussian. Thus twenty-seven belonged to the German race, twenty-six to the Sclavonian, seven to the Magyar, and five to the Italian. Dr. Engel observes, it is remarkable to learn that, in a body almost equally divided in race, the excitable Italian and the dull Magyar should be the two classes that yielded the fewest suicides. Among the suicides there were forty-two common soldiers, seven officers' servants, nine non-commissioned officers, three cadets, eleven officers of higher rank, and three medical officers. Hence the number of persons entrusted with charges was the half of the number of common soldiers, and of these eleven were Germans. Besides the officers' servants and the three medical officers, there were two belonging to the military police, two to the transport corps, thirty-two to the infantry, two to the Guards, nine to the Jagers, ten to the cavalry, two to the "Genie" corps, four to the artillery, and two to the sanitary corps and Quartermaster-General's staff.

In regard to modes of death, shooting was most usual; hanging was performed in sixteen cases; cut-throat in six; stabbing in two; opening an artery in one; fall from a window in one, and into a well in one; drowning in one, and poisoning in three. Of the Viennese, all chose every kind of death except shooting; two hanged themselves, four cut their throats, one stabbed himself, one opened an artery, one poisoned himself by sulphuric acid, and one by cyanide of potassium. Of the other Germans, six hanged themselves, and one cut his throat. Of the Bohemians, two hanged themselves, and one cut his throat. Of the Gallicians, four hanged themselves, one drowned himself, one stabbed himself, and three shot themselves. One Italian cut his throat, one threw himself from a window, and one into a well. One Magyar drowned himself. Most of the officers' servants shot themselves with their master's pistols, and two hanged themselves; one policeman and two of the transport train hanged themselves; two Jagers and two artillerymen hanged themselves, and one artilleryman cut his throat. Of the cavalry, two hanged themselves, two cut their throats, and one opened an artery. The Jagers and the infantry soldiers committed suicide by other modes of death than hanging—a fact naturally explained in the latter case by the difficulty experienced of obtaining firearms. Of the superior officers two hanged themselves, one drowned himself, and the remainder shot themselves. Of the three medical officers, one poisoned himself with cyanide of potassium, one cut his throat, and one shot himself with a pistol. In only two cases was there marked disease of the body.—*Spitals Zeitung*, April 30, 1864.

III. Hygiene.

On Disinfectants and their Applications.—Dr. Elisha Harris has drawn up a most elaborate and practical report on disinfectants for the use of the United States Sanitary Commission. He commences by stating that there can be no substitute for fresh air, and that disinfectants should only be considered as aids in restoring and preserving purity, not as substitutes for cleanliness and pure air.

"The principal disinfecting agents may be classified as follows:

"*Absorbents and retainers of noxious effluvia, particularly the ammoniacal and sulphuretted gases.*	Charcoal, Sulphate of lime (plaster Paris), Sulphite of lime, Silicate of alumina (porous clay).
"*Absorbents of moisture; chemical agents that act upon organic matter, and recombine some of the elements of noxious effluvia.*	Quicklime, Sulphuric acid, Hydrochloric acid, Nitric and nitrous acids.
"*Soluble salts that are particularly available for arresting processes of decomposition, and for controlling phosphuretted and sulphuretted gases.*	Nitrate of lead, Chloride of zinc, Protochloride of iron, Protosulphate of iron.
"*Antiseptics that act diffusively and rapidly, though less permanently than some others. Active in destroying compound gases.*	Chlorine gas, Hypochlorite of soda (*Labarraque's solution*), Chloride of lime.
"*The most prompt and efficient antiseptic known.*	Bromine.
"*Antiseptic, and of great power as an oxidizer, and as an available source of ozone.*	Permanganate of potassa.
"*Antiseptic and deodorant; capable of a great variety, extent, and economy of applications, and acting with considerable energy and permanency.*	Carbolic acid and coal-tar compounds.
"*Destructive of contagious virus and all transportable affections.*	Heat.
"*Destructive of yellow fever miasma, and of the malaria that produces the 'paludal fevers.'*	Frost.

"Considered *theoretically*, we may regard all disinfecting agents under the following heads, and perhaps this would be the more scientific arrangement of them: 1. Absorbents of moisture and of noxious effluvia. 2. Oxidizers (ozone the most active) and deoxidizers. 3. Other chemical agents that break up noxious compounds. 4. Agents that form indestructible compounds with putrescent materials, or that destroy cell-life and the cryptogamic and infusorial organisms. But as the present state of chemical and medical knowledge only enables us to make such general statements respecting the theoretical action of disinfectants, we will follow our first classification by a few practical statements concerning each of the articles mentioned."

Dr. Harris next proceeds to speak of these substances in detail.

"*Charcoal.*"—Of charcoal he says: "Freshly burned and broken, this substance will absorb from ten to fourteen per cent. its own weight of gases and moisture from the atmosphere during the period of twenty-four hours; and it is capable of absorbing ninety times its own volume of ammonia, or fifty-five times its own volume of sulphuretted hydrogen. Properly applied, charcoal is an arrester of putrefaction, and as such it is worthy of more extensive employment in the better preservation of animal food when served out in an unwholesome state by the regimental Quartermasters. As a disinfectant or deodorant for extensive use in masses of putrescent material, and for local purification, fresh charcoal is of acknowledged value.

"*Sulphate of Lime, Sulphite of Lime, and Porous Clay.*—These substances are valuable absorbents of ammoniacal and sulphuretted effluvia, and they constitute exceedingly convenient vehicles and auxiliary menstrua for some of the more potent and expensive antiseptics. The much vaunted French disinfectant, known as the disinfecting powder of MM. Corné and Demeaux, consists of about ninety-four per cent. of finely ground gypsum, and five or six per cent. of coal-tar or the 'heavy oil of coal-tar.' McDougall's powder and the Ridgewood disinfectant consist of carbolic acid combined with the sulphate of lime and porous silicate of alumina, respectively, and will be noticed upon a subsequent page. Hyposulphite of lime possesses the property of absolutely arresting fermentation or the catalytic processes. The several substances of this first class, and their compounds, particularly those with carbolic acid or coal-tar, are among the most valuable disinfectants, especially when large quantities of cheap and effectual articles of the kind are required.

"*Quicklime.*—With sulphuretted and with phosphuretted effluvia, and with humid vapours, freshly burned lime unites with great avidity, and as an absorbent of moisture and a chemical base for many acids it is of peculiar value; but lime also eliminates or sets free the ammoniacal gases, and, like the acids of our second class of disinfectants, it is of *less permanent* value than some other agents. It is one of the most convenient antiseptics, and for local applications, as in whitewashing, sprinkling, desiccating damp surfaces or putrescent substances, and for temporarily arresting putrefaction it is invaluable. Lime should be used dry and unslacked, except it be for the special purpose of combining with carbonic acid gas; for the latter object it should be reduced to a creamy hydrate, and, in overcrowded wards and barracks, it may be usefully employed in this way, distributed in shallow plates. Distributed in like manner, *sulphuric acid* may be employed for diminishing the humidity of the atmosphere in a closed and damp apartment; but for this purpose it is usually better to resort to strong currents of air, by means of through and through ventilation, when practicable.

"*Nitrous Acid.*—The *fumes of nitrous acid* that so long had fame for disinfecting purposes in the barracks, hospitals, and navy of Great Britain, may be readily produced by heating a mixture of nitrate of potassa and sulphuric acid in an iron or porcelain dish. Persons who resort to this method of fumigation should bear in mind the fact that strong fumes of nitrous acid are dangerously irritating to the throat and lungs. These fuming acids are powerful oxidizers, but their avidity for water, together with their peculiarities of chemical affinity, render their value as disinfectants somewhat uncertain.

"*Nitrate of Lead.*—Practical considerations place this salt at the head of colourless disinfecting salts most available for certain local applications, such as deodorizing a close apartment, and the bedding, &c., of sick persons, by means of a solution distributed on shallow vessels or upon saturated cloths. The nitrate of lead is the basis of 'Ledoyen's liquid.'"

After describing the uses of the permanganates, chloride of zinc, the protochloride and protosulphate of iron, and chlorine and its alkaline compounds, Dr. Harris refers to the value of bromine as a disinfectant; the facts will be, to a large extent, new to the English reader.

"*Bromine and its Compounds.*—The most powerful antiseptic has recently been brought into requisition in the military hospitals as a special disinfectant and arrester of gangrene. It is applied topically and diffusively. Bromine is exceedingly penetrating and energetic in its action, and consequently is to be manipulated and applied with proper caution. It is principally employed in its pure liquid form, or in combination with bromide of potassium. Special caution should be used not to respire the strong fumes of any pulverized compound of bromine, as its effects when inhaled are suffocating. The following concise statement of the best methods for applying this potent disinfectant we quote from Dr. M. Goldsmith, Medical Director of Military Hospitals at Louisville, Kentucky, to whom the medical profession is largely indebted for its successful introduction as a topical and prophylactic agent for the control of hospital gangrene and erysipelas:

" *Directions for Use.*

" 1. *For Fumigation.*—Place vessels containing *one ounce* of the solution at different points of the ward, and in number sufficient to secure in the latter the constant presence of the odour of bromine.

" It should be borne in mind that, if the vapour of bromine comes in contact with the vapour of water, hydrobromic acid is formed; therefore, when there is much of the vapour of water disengaged in the apartment, the quantity of the vapour of bromine must be correspondingly increased.

" 2. *Topical application of the Vapour.*—A piece of *dry* lint is to be placed over the diseased part; over this is to be placed another piece of lint, *moistened with the solution of bromine;* over this, a *third* piece, *spread with simple cerate;* the whole to be covered with oiled silk and bandage, so arranged as to retain the vapour in contact with the diseased surface as long as possible. The solution is to be removed as often as it becomes exhausted by evaporation.

" 3. *The Solution, in Substance, as a direct Application in Hospital Gangrene, Diphtheria, Gangrene of the Tongue,* and other diseases of this nature.—The parts are first to be dried by the application of charpie; then the sloughs, if thick, should be trimmed out with forceps and scissors as much as possible, for the thinner the slough the more effective is the remedy. The parts having again been dried, the solution is applied by means of a mop, or a pointed stick of wood, in quantity sufficient to saturate the sloughs. If the sloughs undermine the skin, or dip down into intermuscular spaces, the solution must be made to follow, with the pointed stick, or by means of a glass syringe.

" If the application has been effectual, all odour from the diseased surface ceases, and the sloughs become somewhat hardened. The remedy should be reapplied every second hour, as long as any odour of putrefaction is present, or as long as the sloughs appear to be diffluent. It is not always necessary, especially when the sloughs are diffluent and thin, to use the solution in its full strength; it may be weakened by the addition of water, as the disease subsides.

" The points to be especially attended to, in the use of the solution of bromine, are two: 1. The solution should be applied in strength and frequency sufficient for the impregnation of the whole of the sloughs. 2. To secure this end, the application should be made by the surgeon himself, and never be trusted to a nurse. If the sloughs are thick and cannot well be trimmed, the bromine may be introduced into the thickness of the slough by means of a hypodermic syringe.

" After the topical application of the solution, the parts, when so situated as to render it practicable, should be subjected to the influence of the vapour.

" Surgeons will do well to bear in mind that bromine is a new remedy for the purposes indicated above. The directions for its use given here are those followed in the military hospitals of this city; it may be found advisable to modify them as experience with the remedy accumulates. It is, therefore, earnestly recommended that the subject be studied diligently, that the effects of the remedy be carefully watched, and that the application be varied as new facts are developed in its use.

" The investigation of the evidences respecting the antiseptic and prophylactic powers of this new disinfectant has reasonably confirmed the opinion of its great practical utility. But to secure its beneficial effects, its application should be made with proper care and thoroughness. It claims to arrest the destructive progress of gangrene, erysipelas, &c., and utterly to destroy the personal and the diffused virus of such maladies. To accomplish this effectually, the bromine must be applied to every portion of the virus, and this is to be effected by means of the pipette syringe, the pointed stick, the scissors, and the solution, for local applications; and by its pungent and volatile vapours in wards and other infected places. This disinfectant certainly promises to be a great boon to our military hospitals.

"*Permanganate of Potassa.*—This substance, as a deodorizer and prophylactic, is limited mainly to topical applications to gangrenous parts or putrescent materials, and to general effect upon the atmosphere of contaminated apartments, by means of evaporating cloths saturated with a strong solution of the permanganate. The oxidizing and antiseptic effects of the permanganate of potassa upon organic and putrescent matter are remarkable. It is the most sensitive test for the presence of organic matter, which it oxidizes with powerful facility. As this is an expensive and delicate substance, it is to be employed economically, upon saturated cloths or in dilute solutions upon plates. For purifying offensive water for purposes of beverage, &c., a standard solution should be dropped into the vessel of water, *until the tinge of the permanganate begins to appear.* The rapid and effectual oxidation of the organic (*putrid*) elements of impure water and other substances, even of the atmosphere itself, when brought in contact with solutions of this salt, and the consequent and almost instant deodorization of such impurities, render this disinfectant of priceless value for practical purposes. And as all preparations of manganese are therapeutically tonic, probably the minute quantities of this salt that would be taken in drinking the water purified as above described, would only act beneficially. 'Condy's Disinfectant,' 'Darby's Fluid,' and all the vaunted preparations of 'Ozonized water,' &c., are solutions of permanganates. The salts are cheaper and more reliable than such nostrums, and are now supplied by all medical purveyors in the army.

"*Coal-tar Compounds—Carbolates.*—The carbolate of lime has been employed to some extent in our camps and hospitals. McDougall's powder consists of carbolate of lime, sulphate of lime, and quick-lime. The Ridgewood disinfectant consists of carbolic acid, proto-chloride of iron, &c., combined with fuller's earth. Either of these, which are furnished by the medical purveyors, appear to be quite as valuable as the more expensive article of MM. Corné and Demeaux, which is used at the Imperial camp at Châlons, and was found highly serviceable by Baron Larrey, after the great battles of the Italian campaign. Coal-tar, in almost any form, is available for disinfecting sewers, &c.; and in the dry powders mentioned, it is available for delaying the process of decomposition, whether in a corpse or in refuse material. Carbolic acid has the antiseptic powers of creasote, and is largely sold for that article. The antiseptic powers of coal-tar, its effect upon mephitic gases and putrescent material, the permanency of its operation, and the cheapness of the article, render it available for extensive application in neutralizing and arresting cloacal and noxious effluvia in the processes of animal decomposition. A distinguished medical inspector of our army, when cut off from ordinary medical supplies, effectually and quickly abated the nuisances pertaining to an extensive old fortress, by means of an extemporized mixture of coal-tar, procured from the gas-works upon the premises. For use in chamber vessels, close-stools, &c., a neat fluid preparation may be made, after the formula of M. Demeaux, by mixing equal parts of coal-tar, alcohol, and hot soft soap. With the progress of knowledge respecting the chemistry of coal-tar and other hydro-carbons, the precise value of this class of disinfectants will be better understood. Coal-tar certainly has remarkable efficacy in arresting putrescence and controlling its effluvia."

Heat and Cold.—Dr. Harris concludes his report by noticing the effects of heat and of cold as disinfectants. Heat he considers the cheapest and most effective of disinfectants; and of frost and low temperature he remarks: "Frost or low temperature, when continued a sufficient length of time, will effectually destroy both the miasma that produces yellow fever and the paludal malaria that produces intermittent and remittent fevers; but such low temperature has no effect to arrest those fevers in the persons suffering them. It is worthy of note, that a freezing temperature does not appear to mitigate the activity of the personally infectious poisons, or contagions; though, with certain exceptions, it arrests putrefaction and the catalytic or fermentative processes."—*The Sanitary Commission Bulletin*, Nov. 1863.

[We may remark on this report, that in it one of the best and readiest of disinfectants—we mean iodine—is allowed to pass without a word of notice. Iodine may be used either in the solid form, in the state of vapour, or as tincture. We would also observe that Dr. Harris, probably owing to a clerical error, speaks of bromine as an antiseptic. Bromine is a destructive of organic tissues and structures, and cannot therefore be an antiseptic. But some disinfectants act as such because they prevent any and every organic transformation, and these are antisepties: ammonia is of this number. In classifying disinfectants we should take a simpler view than Dr. Harris has done, and should arrange the whole of them under two heads: 1. Destroyers of organic matter, ozone being the type of the class. 2. Preservers of organic matter, or antiseptics, ammonia being the type of the class.—B. W. R.]

IV. Summary.

The following summary refers to papers which, from want of space, cannot be quoted at length in this report:—

1. *On the Means of increasing the Salubrity of Large Towns.* By M. Robinet. (*Comptes Rendus*, April 25, 1864.)—The author suggests in this paper, of which only an abstract is given, that the sewer air of large cities should be removed by being drawn off through the furnaces of the large manufactories.

2. *A Case of Suicidal Cut-throat.* By Alexander T. Gunning, Esq., L.R.C.S., Edinburgh. (*The Australian Medical Journal*, March, 1864.)—The suicide in this case divided the space between the thyroïd cartilage and the hyoïd bone, completely dividing the larynx and exposing the superior surface of the vocal chords. The patient refusing resolutely to be fed by the mouth, Mr. Gunning fed him with a catheter through the large wound, passing the tube into the œsophagus. In time the patient fed himself by the wound. He lived in this state for a considerable time, but died in the Melbourne Hospital on closure of the wound.

3. *Poisoning by Datura Stramonium, in which Recovery followed the use of Opium.* By A. Paul Turner, M.D. (*American Journal of the Medical Sciences*, April, 1864.)—The patients—two children, one of eight, the other of ten years old—ate the seeds of datura stramonium, and suffered from intense symptoms of narcotic poisoning. After free emesis, produced by sulphate of zinc and cold affusion, each child had given to it by Dr. Turner seven minims of tincture of opium, two hours and a half later ten minims more, and two hours and three-quarters later, and three hours later still, five minims more. Both patients gradually recovered. We think it doubtful whether the emetic was not the antidote rather than the opium.

4. *Quinine as a Prophylactic against Malarial Poison.* By Dr. J. W. Page. (*The Sanitary Commission Bulletin of America*, Feb. 1, 1864.)—Dr. Page reports that amongst the forces stationed about the malarial districts of Newbern, quinine has been administered daily to the healthy soldiers with the most

beneficial results. The quinine is considered in the light of a food, and is served out as "a ration."

5. *Insanity before the Tribunals.* By Dr. Legrand du Saulle. (Paris, Savy, 1864. (Vol. IV.)—A very complete work, having reference to the competency of the insane in a legal sense. The book is of more special interest to the French than the English reader; but it contains many curious facts in reference to the wills and endowments of the insane, and of the motives that may make valid or invalid such documents.

6. *Gold-dust and Iron-filings as an Antidote for Corrosive Sublimate.* By Dr. C. Johnston. (*American Journal of the Medical Sciences for June*, 1864.)—This antidote, proposed by Buckler, and tried by him in experiments on animals, is suggested on the theory that the gold-dust and iron filings form an amalgam of gold and mercury on the one hand, and of perchloride of iron on the other. Dr. Johnston tried the antidote on a man who had swallowed forty-five grains of corrosive sublimate. Recovery was perfect, but was preceded by acute salivation, from which it may be inferred that the amalgam of gold and mercury is not an inert substance in the digestive tube. The treatment of the case is unfortunately complicated, as albumen was also administered, together with milk.

7. *On the Presumed Physical Degeneration of the Population of France compared with other European Populations.* By M. Legoyt.—This work is intended to refute the popular opinion, held in France and elsewhere, that the French nation is on the decline. Legoyt says that France figures, as regards military aptitude, if not in the first rank, at least amongst those nations having the fewest exemptions from infirmity or meanness of stature.

8. *The Hygiène of Theatres.* By M. A. Tripier. (*Annales d'Hygiène Publique*, July, 1864.)—A long essay, extending over thirty pages of the 'Annales,' and illustrated by four plates. The author describes the best methods for lighting, warming, and ventilating theatres and other places of public resort. The paper is well worth the perusal of medical officers of health of large towns.

9. *A Singular Case of Feigned Disease.* By Dr. Merland. (*Ibid.*)—In Dr. Merland's case, a woman for eighteen months feigned various diseases—viz., paralysis and blindness. She accused two persons of being the cause of her suffering, and both were brought to trial, but acquitted, the fraud on the part of the accuser being discovered.

10. *On Anaphrodisia produced by the prolonged use of Arsenical Preparations.* By Dr. J. M. Charcot. (*Bulletin Général de Therapeutique*, July, 1864.) The author brings forward two cases to show the effects of arsenic where the use of the drug is prolonged in the production of anaphrodisia. The symptom, as a result of arsenical treatment, has not, he thinks, been previously recognised as it merits to be.

11. *Mechanism of Death by Inanition.* By Professor Panum. (*Virchow's Archives*, July, 1864.)—Professor Panum says that in complete inanition neither the fibrin nor the corpuscles, nor the colouring matter of the blood, are changed. Hence the blood, *per se*, is not the nutritive substance, but merely the means of transport of nutritive matters derived from the stomach. Neither blood-corpuscles nor fibrin are essentially nutritive matters, but a certain portion of the albuminous matter of the serum ought to be looked on essentially as the true nutritive matter of the body. The symptoms of inanition, therefore, do not arise from want of blood, but from debility of the nervous and muscular systems. He suggests that transfusion of blood in inanition is injurious rather than useful.

12. *Poisoning of Four Kabyle Children by the Root of a Plant supposed to be the Carlina Acanthifolia.* By M. Cabasse. (*Gazette des Hôpitaux*, July 14, 1864.)—The interest of this paper lies in the suggestion that symptoms

due to a poison new to Europeans are described. There are two different species of the plant, which is known in Africa under the name of addade, and which is a kind of wild artichoke. The young leaves of one species are often eaten by the natives in times of scarcity, but the other species is poisonous. The four children reported ate of the poisonous variety, and all died. The symptoms were those of gastro-intestinal irritation. The pupils are dilated by the poison.

QUARTERLY REPORT ON SURGERY.

By JOHN CHATTO, Esq., M.R.C.S.E.

I. *Case of Tetanus, following an Operation for Cancer Uteri.* By Dr. HEINEKE. (Greifswalder Med. Beiträge, vol. ii. No. 2.)

THIS case occurred in the person of a delicate woman, aged thirty-two, who had previously borne two children. On the 9th of September the vaginal portion of the cervix uteri was removed by the galvano-caustic, on account of the existeuce of villous cancer. Six days afterwards hæmorrhage came on, requiring the employment of perchloride of iron and cold water injections. The bleeding returned again and again, producing the most dangerous exhaustion. She rallied, however, and had recovered her strength so far as to be able to sit up, when, on the 16th of October, she first complained of symptoms of approaching trismus. The muscular contraction increasing, the patient was put into a state of complete narcosis by means of chloroform. Temporarily and only partially relieved, the tension of the muscles of the jaws became again as forcible as ever, notwithstanding the employment first of atropine, and then of opium. By the 20th, the muscles of the neck and spine had become implicated, and continuous tetanic spasm gradually seized the muscles of the trunk and extremities. The opium was of no avail, and the deepest narcosis by chloroform failed to subdue the tetanic contraction. She died on the 27th of October. As to the cause of the tetanus, Dr. Heineke is inclined to attribute it rather to the long continuance of the cold irrigation used to subdue the hæmorrhage, than to the operation itself; for at the time of the attack the wound was healing kindly.

II. *On Phimosis, in relation to Hernia in Infancy.* By Dr. FRIEDBERG. (Prag. Vierteljahr., No. 1.)

Dr. Friedberg some time since called the attention of the profession to the influence which narrowness of the prepuce exercises in the production of hernia in children, in consequence of the straining during the passage of urine which it gives rise to. This condition of things being relieved, the hernia soon becomes cured, even without the application of a truss. In the present paper he brings forward additional evidence, derived from the observation in his clinic of 111 cases of hernia occurring in children, at ages varying from eight days to one year. An analysis of these cases leads him to the following conclusions: 1. The number of boys exceeded that of the girls by 62 per cent. 2. Of the boys, 27·7 per cent. suffered from aggravated congenital phimosis. 3. The number of boys in whom more than one hernia existed was nearly double in those who were labouring under a high degree of phimosis. 4. After operating for the phimosis, the hernia disappeared in a remarkably short time, and quickly in proportion as the child was younger. It is not meant to be asserted that phimosis always impedes the flow of urine, and causes an amount of straining which, in those children in whom the passages remain more open than usual, may give rise to hernia. This is only the case in aggravated phimosis, which compresses the glans, and compels the child to make great and painful efforts. In moderate phimosis no such compression is produced, unless, indeed, as may happen, inflammatory action is induced by the retention of preputial secretion. When in a child with phimosis there is great straining of the abdominal muscles, incision of the prepuce is indicated; and after the incision has been made, the mucous membrane should be carefully raised from the glans by means of a director, so that all constriction may be completely removed. Sometimes, when the prepuce has been supposed to have been incised, a fold of the skin only, and not the mucous membrane, has been cut through.

III. *On Calculous Diseases in Russia.* By Dr. Klein. (Langenbeck's Archiv, Band v. No. 1.)

Dr. Klein observes that while so many statistical accounts have been published in France, England, and Germany, with respect to the prevalence of calculous affections in these countries, and the results of the different modes of treatment, little beyond mere hearsay has transpired with regard to Russia. Whatever may be the cause of this, it has not arisen from want of material; and having resided for several years as assistant in the Moscow Surgical Clinic, the author is desirous of contributing something towards supplying a desideratum. He believes that in no country is lithiasis more prevalent than in the centre of European Russia, the dwellers in the upper region of the Volga being especially liable to it. The northern and southern portions of the empire furnish a smaller contingent, while in the western provinces the disease is rare. The hospitals of the great towns, especially those of Moscow and Kasan, are the great resorts of these patients; so that, for example, at certain times of the year, a fifth part of the entire number of the patients of the Moscow Surgical Clinic consists of stone cases, more than sixty of these per annum applying for treatment. The great bulk of these persons belong to the class of country people, children being three times more numerous than adults, while so rare is the disease among females, that of 1792 patients treated during the years 1822–60 only four were females. The composition of the calculus is usually compound, pure uric acid or oxalate of lime calculi being rarely met with. The nucleus is usually composed of uric acid and its salts, which is succeeded, in the great majority of cases, by oxalate of lime, while the phosphates often forming the almost entire calculus in other cases, furnish only the outer layers. In Russia, uric acid calculi are found much less often than in the rest of Europe, the oxalates and phosphates being much more frequently met with. It is to be presumed that the almost exclusive use of vegetable food and sour drinks by the peasantry may contribute to the prevalence of the oxalates, although that other unknown causes are in operation is seen by the fact of the disease being met with soon after birth and during lactation.

It often happens that adults only apply to the hospital when the disease has become too advanced to admit of an operation being performed, and even in children the stone has frequently been allowed to attain a large size. Chiefly in consequence of this delay in seeking relief, lithotomy has usually been the operation resorted to. Unfortunately, the statistics of the Russian hospitals have not as yet been published, and the author is obliged to confine himself to a statement of the results obtained at some of the Moscow hospitals, as reported by Dr. Bassoff or observed by himself. These figures are, however, larger than those published in English and French treatises, and refer to 2968 cases treated in 1804–41, and to 1518 treated in 1822–60, making a total of

4486 cases. In the first series of operations, there were 2694 recoveries and 274 deaths; in the second, 1240 recoveries and 278 deaths—i.e., a total of 4486 cases, with 3934 recoveries and 552 deaths. This amount of success, which the author has good reason to believe has been also attained in other Russian hospitals, is somewhat superior to that obtained by English and French operators, and is in a great measure due to the large proportion of children which furnished the cases operated upon. Lithotrity, up to 1860, has been performed in the Moscow Hospital upon 222 patients. In 24 cases it had to be supplemented by lithotomy, 19 of the patients dying, and 5 recovering. Of the other 198 cases, complete recovery took place in 167, and 31 proved fatal. The proportion of deaths (1 in 6·35) was greater than that attendant upon lithotomy (1 in 8), the greater ages of the patients submitted to it having, however, to be borne in mind. In 62 cases, occurring in patients from one to fifteen years of age, 6 only terminated fatally. In 24 cases, a single *séance* sufficed for the removal of the entire stone, which in several instances measured eleven lines. As to the cause of death after lithotrity, this almost always arose from acute kidney disease and its consequences, cystitis being seldom met with, while in patients dying after lithotomy, urinary infiltration, cystitis, peritonitis, and pyæmia were the usual occurrences. Kidney disease, then, should be considered as an almost absolute contra-indication to lithotrity, as even the gentlest manipulation may then be followed by the worst consequences. In the Moscow Clinic, 405 patients were operated upon for stone during 1849-59. Of these, 293 were children (1 to 15 years of age), and 112 adults (15 to 65). Lithotrity was performed 30 times in the first category of cases, and 55 times in the last; so that of 10 children, 9 were operated upon by lithotomy and 1 by lithotrity; and of every 2 adults, 1 underwent lithotomy and the other lithotrity. Lithotrity was also performed upon 4 females with success.

IV. *On some Points in the Treatment of Diseases of the Rectum.* By Dr. Van Buren. (American Medical Times, May 7th.)

Dr. Van Buren, after adverting to the necessity of bringing the patient under complete anæsthetic influence before introducing the speculum, describes the position which he regards as best suited for this purpose, and which is, in fact, that employed by Dr. Marion Sims in his operations upon the vagina. "The patient is placed with the upper part of the trunk in a prone position, the front of the thorax in contact with the bed or table, the head on its left side, the left arm brought out at the left side and carried behind the back, the pelvis on its left side, with the legs flexed at a right angle, and the buttocks exposed towards the light, and elevated sufficiently to permit the abdominal viscera to gravitate towards the diaphragm . . . . The speculum I employ is a modification of that used by Dr. Sims for the vagina, the modification consisting in the notch at its angle intended to receive the sphincter muscle, and thus to resist the tendency of the instrument to slip out when the muscle is put upon the stretch, and the alteration of the handle, which is so shaped as to clear the buttock when it is swept round in order to bring all sides of the cavity of the gut into view. To facilitate still farther this manœuvre, and to protect the stretched mucous membrane from abrasion, the edges of the blade are carefully rounded and turned inwards. The speculum being introduced, and the sphincter put upon the stretch with one hand, the other hand is used to draw the parts away on the opposite side of the orifice; and the handle of the instrument being then gradually swept around, the light falls successively upon the exposed and expanded cavity. By the use of this manipulation, applied in the position just described, I have frequently obtained a satisfactory view of the whole extent of the cavity of the rectum as high as its upper curve."

For the relief of *fissure*, or rather *irritable ulcer of the rectum*, as Dr. Van Buren prefers terming it, he regards forcible dilatation of the sphincter as an operation justified by theory and approved by practical results, and as one which should always be substituted for the knife. "Forcible dilatation, as I have been in the habit of performing it—by introducing the two thumbs into the anus, flexing them so as to include the breadth of the sphincter, and then, taking a purchase with the outstretched hands from either buttock, drawing them forcibly asunder until arrested by the ischial tuberosities—effects such a stretching of the fibres as to paralyse the sphincter for at least a week, during which time the ulcer assumes a healthy appearance, and rapidly heals, the pain ceasing entirely from the time of the operation . . . I have been asked whether the paralysis of the sphincter produced by dilatation is ever followed by incontinence or loss of control over the contents of the lower bowel. The relaxed and flabby appearance of the orifice after the operation certainly suggests the idea; and the fact that when the patient is asked to contract his sphincter by voluntary effort he generally expresses his inability to do so, looks in the same direction. But in upwards of twenty cases which have come under my observation, I have never seen any indication of incontinence, and I believe the internal sphincter to be equal to any emergency likely to arise during the temporary suspension of the functions of the more powerful external muscle. I have reason to believe that in some cases the muscular fibres of the sphincter are actually ruptured in the stretching process; but no harm or delay in the cure has arisen from this."

"This remedial measure has a wider application than to the treatment of irritable ulcer. In inflamed hæmorrhoidal tumours, or any painful inflammatory affection of the anus, where the spasmodic contractions of the sphincter constitute the principal source of the pain and obstruction of the circulation, the stretching of the sphincter, with or without the intervention of an anæsthetic, will afford prompt and certain relief. It is equally applicable to the affection described by some authors as 'spasm,' and by others as 'painful contraction' of the sphincter, and also in the 'neuralgia of the anus' of nervous subjects and hysterical women. I have been in the habit for some years past of employing this manœuvre after the operation for the cure of hæmorrhoidal tumours, whether by ligature or the use of the écraseur. The result has always been favourable. The patient is entirely saved from the severe pain, generally lasting several days, which is caused by the pinching of the tender and inflamed parts by the spasmodic contraction of the irritable sphincter. By throwing it out of play, the suffering after the operation is reduced to a very moderate degree of local soreness, and the necessity for the employment of the catheter through sympathetic disturbance of the sphincter of the bladder is abolished."

V. *On Hydrocele in Children.* By M. Guersant.
(Bull. de Thérapeutique, July 15th.)

Hydrocele is often met with in children, in its two varieties of hydrocele of the tunica vaginalis, and encysted hydrocele of the cord. When congenital, hydrocele of the tunica vaginalis usually, but not always, is in communication with the peritoneum. Occasionally it is dependent upon disease of the testis; but this is very rarely the case in children. Hydrocele is not a grave disease, as it is generally curable with, or even without, an operation. Left to itself, it will sometimes spontaneously disappear, especially when it is in communication with the peritoneum. Its dispersion may be aided by lotions and a suspensory. Lotions made with roses infused in wine, and especially with equal parts of tincture of digitalis and water, applied to the scrotum for two or three weeks in succession, have sometimes succeeded in M. Guersant's hands; but these means are of quite secondary importance, compared with the operation.

With respect to the operation, the simple tapping, ordinarily only palliative, sometimes proves curative, and should always be tried. For the performance of the radical cure, the child should be laid on his back, assistants holding his buttocks apart. M. Guersant prefers a flat trocar, which, being terminated by a lanceolated point, penetrates slowly, like a lancet, without any jerk. By it the puncture can be carried exactly as far as is desired. For more than twelve years he has abandoned the use of wine, or even iodine, as the injecting fluid, employing in preference cold alcohol of 36°. Enough of this is thrown in to enable the tumour to regain its former volume, and after remaining two or three minutes, it is allowed to flow out, it being of no consequence if a small portion remains behind. This injection causes less pain than wine or iodine, and induces only a moderate, but a sufficient, amount of inflammation. No application need be made to the scrotum, and next day, if there is not tenderness, the patient may walk about the room. If, however, this does exist, he must lie down and wear a suspensory. The tumour increases gradually in size until it has nearly regained its original volume, and applications containing some diluted spirit of camphor or alcohol may be made to it. By the end of the second week it will have gradually diminished in size, and the child have become cured. It is only in very rare instances that emollients and baths are required to subdue inflammation; and in more than a hundred cases M. Guersant has never met with a relapse. In cases in which, either prior to the operation or after the puncture, the testis is recognised as being swollen, and especially if the child be scrofulous, tincture of iodine, diluted with two-thirds of water, should be substituted for the alcohol. In some cases, the hydrocele is separated by one or two partitions, and then, having traversed these with the trocar, a filiform seton should be passed through them, and left in for three or four days.

Congenital hydrocele is sometimes cured in the process of time by aid of a simple suspensory, and at others by means of a herniary bandage, very carefully applied and watched over by the parents, so that the escape of fluid by the aperture may be prevented. In general, however, an operation will be required; but one or two palliative punctures should be tried before resorting to the alcoholic injection. When this is employed, great care must be taken in making effectual compression on the ring while throwing in the liquid, which should be done very slowly. In a case under M. Guersant's care, the nature of which was misapprehended, twenty grammes of alcohol were thrown into the peritoneum without any ill effect resulting. Still, the importance of endeavouring to avoid this by compression of the ring cannot be doubted.

In encysted hydrocele of the cord, the alcoholic injection usually suffices for a cure. A small seton, passed as in an abscess, has also furnished M. Guersant good results, being attended neither with severe inflammation nor relapse.

VI. *On Sympathetic Ophthalmia.* By Mr. Critchett. (Annales d'Oculistique, May and June.)

At the meeting of ophthalmologists which took place last autumn at Heidelberg, Mr. Critchett read an interesting paper upon that untractable affection, sympathetic ophthalmia, terminating it with the following conclusions: 1. The wounds which give rise to this form of ophthalmia are those which implicate the ciliary region. 2. The effects of this form of inflammation on the eye differ in important particulars from those induced by other forms of iritis. 3. Neither medical nor surgical treatment exercises any favourable influence upon this condition of the eye. 4. Before commencing any operation, all inflammatory action should have ceased, and even then the prognosis must be very guarded. 5. Seeing the indomitable nature of this form of inflammation, and the danger there is of the supervention of complete blindness, the most prudent course would probably be, in wounds of the ciliary region causing prolonged irritation, to extirpate the injured eye before any sign of inflammation has manifested itself in the other.

In the discussion which followed, Professor von Graefe observed that, besides this dangerous irido-cyclitis described by Mr. Critchett, sympathetic ophthalmia may also present itself under the form of serous iritis. The causes of the affection are, the presence of foreign bodies giving rise to continuous irritation, the persistence of irido-choroïditis in the bad eye, attended with excessive sensibility at the points corresponding to the ciliary body, the rapid changes in the tension from repeated hæmorrhages, and the irritation arising from calcareous deposits. When the existence of the sympathetic ophthalmia is well established, the enucleation of the globe is indicated; but whenever foreign bodies exist within the eye, these should be extracted as a preventive measure. Professor Donders, besides the forms of sympathetic ophthalmia already indicated, referred to a third affection, characterized by excessive photophobia, with impossibility of employing the eye, although this does not exhibit the slightest pathological alteration. He had met with cases in which the patients believed themselves completely blind, until the enucleation of the globe containing a foreign body entirely restored the sight. M. Warlomont was desirous also of eliciting opinions respecting the effects of chronic disease of the eye, as glaucoma, or idiopathic irido-choroïditis, in exciting sympathetic affection of the sound eye, and the propriety of extirpating the glaucomatous eye as soon as symptoms of the disease are manifested in the sound one. Professor von Graefe believed that the frequency of sympathetic ophthalmia of this nature has been exaggerated; and although chronic choroïditis may be thus produced, he feels persuaded that this is not the case with glaucoma.

Summary.

Amputation.—Hewson, Pirogoff's Amputation. (American Journal of Med. Sciences, July.)—Fux, Two Cases of Amputation at the Shoulder-joint. (Wien Wochenblatt, Nos. 29 and 31.)—Azam, Excision of Nerves in Irritable Stump. (Gaz. des Hôp., Nos. 72, 74, and 77. Azam relates a case in which this was performed twice. The tendency of the discussion at the Société de Chirurgie was to regard this as a mere palliative.)

Aneurysm.—Broca, Case of Fatal Arterio-venous Aneurysm at the Bend of the Arm. (Bull. de la Soc. de Chirurgie, tom. iv. p. 392.)

Artery.—Cutter, Case of Successful Ligature of the External Iliac. (American Journal of Med. Sciences, July. With a Statistical Table.)—Dick, Wire-compress as a Substitute for Ligature. (Edinb. Med. Journ., September.)

Bronchocele.—Hedoin, Epidemic of Goitre. (Recueil de Méd. Militaire, June. This occurred in a battalion quartered in the High Alps during five months, 65 cases occurring in an effective force of 334.)

Cataract.—Singer, Two Cases of Pyramidal Cataract. (Wien Wochenschrift, Nos. 14, 17, 19, and 20. Some interesting remarks upon this variety of capsular cataract.)

Dislocation.—Demarquay, Case of Double Dislocation of the Jaw. (Bull. de la Soc. de Chirurgie, vol. iv. p. 119.)—Richet, Two Cases of Dislocation of the Cervical Spine. (Ibid., p. 490.)—Morel-Lavallée, Case of Sub-acromial Dislocation of the Clavicle. (Ibid., pp. 50 and 241.) Duplouy, Case of Dislocation of the Cervical Spine. (Archives de Méd. Navale, No. 8.) Case of Complete Lateral Dislocation of the Fifth Cervical Vertebra without Fracture.

Attempts at reduction were made, the patient dying soon after.)—Martial, Five Cases of Incomplete Lateral Dislocation of the Cervical Spine. (Wien Wochenblatt, Nos. 13, 15, 16, and 23.)

Ear.—Demarquay, Case of Fibrous Tumour of the Lobule of the Ear. (Gaz. des Hôp., No. 79.)—Roosa, Aural Polypi. (American Med. Times, Aug. 5.) —Grüber, Myringodectomy. (Allgem. Wien Med. Zeitung, Nos. 13–24. Cases exemplifying its utility in long-standing deafness and tinnitus.)—Von Tröltsch, Politzer's Mode of Insufflating the Eustachian Tube. (Archiv für Ohrenheilkunde, No. 1. This mode, which consists in forcing air into the nares during the act of deglutition, is described by Von Tröltsch as the greatest improvement in modern aural surgery.)

Eye.—Fano, Myodesopsy. (Union Méd., Nos. 83, 86, 89, and 91. Under this name, the author gives an interesting description of muscæ, both volitant and fixed.)—Rava, Account of Professor Quaglino's Ophthalmic Clinic at Pavia. (Gaz. Méd. Italiana, Nos. 28–33.)

Fingers.—Eulenberg, Flexion and Contraction of the Fingers. (Berlin Med. Wochenschrift, No. 22.)

Fissure.—Pelvet, Case of Congenital Fissure of the Cheek. (Gaz. Méd., No. 28.)

Fracture.—Delens and Champouillon, Cases of Fracture of the Clavicle by Muscular Exertion. (Gaz. des Hôp., Nos. 94 and 98.)—Bourguet, Case of Ununited Fracture treated by Injections. (Bull. de la Soc. de Chirurgie, tom. iv. p. 194.)

Hemeralopia.—Rüttner, Hemeralopia. (Petersb. Med. Zeit., No. 2. An account of an epidemic which occurred in one of the prisons at St. Petersburg.)

Iridodesis.—Steffan, Iridodesis. (Archiv für Ophthalmol., Band x. No. 1.)

Jaw.—Aubry, Cases of Immobility of the Jaw treated by Rizzoli's Operation. (Gaz. des Hôp., No. 89.)—Forget and Verneuil, Rizzoli's Subperiosteal Excision of the Jaw. (Bull. de la Soc. de Chirurgie, tom. iv. pp. 125–314. Led to a discussion in the Society on the part played by the periosteum in the reproduction of bone after excision.)—Discussion in Soc. de Chirurgie on Esmarch's Operation in Immobility of the Jaw. (Ibid., pp. 27–308.)—Legouest, Apparatus for Deformities of the Palate after Excision of the Jaw. (Ibid., pp 19–23.)

Laryngoscope.—Tobold, Pocket Laryngoscope. (Berlin Med. Wochenschrift, No. 26.)—Turck, A Spring Mirror-holder. (Allg. Wien Med. Zeit., No. 32.)—Henry, Improved Mode of Concentrating Light. (American Med. Times, No. 26.)

Lithotomy.—Case of Fatal Lithotomy. (Bull. de Thérap., June 15. The calculus was engaged in the neck of the bladder.)—Guersant, Treatment of Fistulæ after Lithotomy in Children. (Bull. de Thérap., June 30.)

Nævus.—Babu, Case of Nævus successfully treated by Perchloride of iron. (Union Méd., No. 97.)

Ophthalmoscope.—Leibrich, Modification of his Ophthalmoscope. (Annales d'Oculistique, June.)

Ovariotomy.—Peaslee, Successful Case of Double Ovariotomy. (American Journal of Med. Sciences, July.)—Keith, Twelve Cases of Ovariotomy. (Edin. Med. Journal, August.)—Buchanan, Successful Case of Ovariotomy. (Glasgow Med. Journal, July.)—Tracy, Successful Case of Ovariotomy. (Australian Med. Journal, June.)

Parotid.—Verneuil, Extirpation of the Parotid, with Preliminary Ligature of the Carotid. (Bull. de la Soc. de Chirurgie, tom. iv. pp. 387–449. A discussion on preliminary ligature of arteries.)

Plastic Operations.—Viennois, Case of Osteoplastic Restoration of the Nose. (Gaz. des Hôp., No. 88. Contains the details of one of M. Ollier's successful cases.)—Duboué, Autoplasty in Vesico-vaginal Fistula. (Ibid., No. 95.)

Polypi.—Semelleder, Two Cases of Polypi of the Larynx. (American Med.

Times, May 28 and June 4.)—Debout, Treatment of Naso-pharyngeal Polypus by the Continuous Galvanic Current. (Bull. de Thérap., July 30. In allusion to its successful employment by M. Nélaton.)—Verneuil and Piachaud, Naso-pharyngeal Polypi. (Bull. de la Soc. de Chirurgie, tom. iv. pp. 88–107.)

Strabismus.—Von Graefe, Convergent Strabismus, dependent on Myopia. (Archiv für Ophthalmol., Band x. No. 1.)—Lecorché, Convergent and Divergent Strabismus. (Archives Générales, July.)

Stricture.—Mercier, Catheterism in Reputed Impermeable Stricture. (Gaz. Med., No. 32, 33.)—Dolbeau and Perrin, Urethrotomy in. (Bull. de la Soc. de Chirurgie, tom. iv. pp. 209–260. With a discussion.)—Beyran and Voillemier, New Urethrotome. (Ibid., pp. 365–403.)—Ricordi, New Urethrotome. (Omodei Annali, June.)

Tetanus.—Rex, Case of Traumatic Tetanus. (Archiv. de Méd. Navale, No. 8. Recovery took place under the use of opium and prolonged vapour-baths, inducing profuse sweating.)—Lemaire, Case of Spontaneous Tetanus in a Boy. (Bull. de Thérap., July 30. Sweating and the Calabar bean were successfully employed.)

Tonsillotome.—Reipprecht, A New Tonsillotome. (Med. Woch. No. 21.)

Tumours.—Berend, Cases of Large Congenital Tumours. (Berlin Med. Woch., No. 24.)—Trelat, Case of Tumour arising from Dilatation of Lymphatic Vessels. (Gaz. des Hôp., No. 78.)—Von Graefe, On Tumours. (Archiv für Ophthalmol., Band x. No. 1. Some interesting cases of tumours situated in various textures of the eye.)—Bryck, Cases of Cystic Tumours of the Neck. (Med. Wochenschrift, Nos. 22 and 23.)

Urine.—Duclos, Retention of Urine. (Bull. de Thérap., June 15 and 30. Cases to prove that this may arise from varices of the neck of the bladder, and that it is best treated by *sondes à demeure.*)

Wounds.—Gurlt, Wounds as observed in the Danish War, and Improved Transport Carriage. (Berlin Med. Wochenschrift, Nos. 25 and 26.)—Cocad, Penetrating Wounds of the Abdomen with Issue of Omentum. (Rev. de Méd. Militaire, June.)—Langier, Suture of the Median Nerve after a Wound. (Gaz. Méd., Nos. 27 and 31. Sensibility and mobility returned.)—Konig, Injuries to the Lungs. (Archiv der Heilkunde, Nos. 2, 3, and 4. An elaborate paper, founded on experimental and clinical investigation into the mode of healing and treating wounds of the lungs.)

QUARTERLY REPORT ON MIDWIFERY.

By Robert Barnes, M.D. Lond., F.R.C.P.,

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I. Physiology.

On the Pelvis considered in the Various Races of Man. By Dr. Joulin. (L'Union Méd., 71, 1864.)

Dr. Joulin having examined comparatively the pelvis of the different races of man, has arrived at the following conclusions:

1. The slight differences observed in the pelvis of the three human races have nothing truly characteristic. They only appear when the comparison is extended to a certain number of subjects; they are not sufficiently marked to impart an obvious character to an isolated pelvis.

2. The Mongolian and negro races present an *identity* which does not permit them to be distinguished. If, then, the examination of the cranium divides

human kind into three principal races, the examination of the pelvis furnishes only two groups. In the first, Dr. Joulin places the Aryan and Caucasian races; in the second, the Mongolian and Negro.

3. In all the races, contrary to what has been said, the transverse diameter of the brim is larger than the antero-posterior.

4. In the pelvis of the negress and the Mongolian woman, the oblique diameter of the brim differs from the transverse only by a few millimetres. In the Aryan the difference is a millimetre and a half.

5. The verticality of the ilia is more pronounced in the Mongolian and Negress than in the Aryan.

6. In the races, the direction more or less vertical of the ilia does not agree with the form of the cranium but with that of the chest. In the dolicho-cephalous negro and the brachi-cephalous Mongolian the iliac fossæ have the same direction because the thoracic conformation is the same.

7. In the Mongolian and negro races the transparency of the iliac fossæ is always recognisable, but it is less than in the Aryan.

8. The highest point of the cresta ilii is in the three races at the middle.

9. It is not exact to say that in the negro race the iliac crest always attains a higher point of the lumbar vertebræ than in the Aryan; but the variations in the degree of elevation are more frequent and marked. In this respect, as in all the others, the Mongolian resembles the negro.

10. The pelves of the yellow and negro races have a less capacity than those of the white race; they are shallower, and the pubic arch is by some degrees larger.

11. There exists no correlation between the form of the head and that of the pelvis.

These conclusions are based upon the examination of seventeen pelves of negresses, and nine of Mongolian women.

II. The Non-pregnant State.

1. *Four Cases of Retro-uterine Hæmatocele; Cure by Resorption; in one case by Perforation into the Rectum.* By Dr. Saexinger. (Monatsschr. für Geburtsk., June, 1864.)
2. *Two Cases of Retro-uterine Hæmatocele; Cure by Puncture of the Vagina in one case, Death through General Peritonitis in the second case.* (Ibid.)
3. *On Retro-uterine Hæmatocele.* By Dr. Willoughby Wade. (Lancet, Sept. 1864.)
4. *Successful Case of Double Ovariotomy; One Hundred and Thirty-five Injections made into the Peritoneum during Seventy-eight Days.* By E. R. Peaslee, M.D. (Amer. Journ. of Med., July, 1864.)
5. *Three Attacks of Peritonitis; Pyæmia; Nine Attacks of Phlebitis; Treatment by Impermeable Covering of the Skin; Cure.* By Dr. Robert de Latour. (L'Union Méd., 71, 1864.)

1. 2. Dr. Saexinger relates a series of four cases of retro-uterine hæmatocele, and a second series of two cases. In the first series, the origin of two cases seems to have been a chill during menstruation. In one the woman had carried a heavy weight and submitted twice to coitus during menstruation. Three cases recovered by resorption. In one case a quantity of dark fluid blood escaped by the rectum, with rapid amelioration. In one case peritonitis intervened. Professor Seyfert, in whose clinique these cases occurred, resorts to puncture only when intense pains or rapid increase of swelling require it. In a fifth case, which was rapidly fatal, there was found an effusion of four pounds of blood in the peritoneum. The source was a burst varix near the fundus of the uterus.

In the second series of cases, one came on after violent exertion during menstruation. Acute sacral pains and profuse hæmorrhage followed. Rapid swelling of the abdomen. Puncture was made through the vagina; a pound of tea-like blood issued. Quick recovery took place.

Case 2.—A single woman had, in consequence of cold during menstruation, peritonitis. Recovered from this, and menstruating again, symptoms of hæmorrhagic effusion appeared. She sprang out of bed in a fright; her condition was much aggravated; rigors, fever, enormous swelling of abdomen followed, then vomiting and death. Blood was found effused in the abdomen, and peritonitic exudations. Behind the uterus to the left, was a sac the size of a child's head, the wall of which consisted of a leaden-grey strong membrane, three lines thick, and which also enclosed the left ovary and tube. The cavity was filled with blood coagulated, and a brown, foul-smelling, bloody fluid. The left ovary was as large as a hen's egg. There was a clot in the left tube. The source was hæmorrhage of the ovary.

3. Dr. Wade submits that, in cases of retro-uterine hæmatocele, there is observed a discharge of altered blood, similar to that which flows from a perforation of the rectum, preceded by uterine pains, and seem to flow from the uterus; followed by rapid diminution of the tumour, and increased solidity of it, occurring at a non-menstrual period, the colour and odour of it being dissimilar to those of the menstrual fluid. Dr. Wade infers that this fluid comes directly from the cyst into the uterus, into which it probably finds its way through the Fallopian tubes. Dr. Wade cites cases from his own experience, and others from Voisin, which appear to him to justify the conclusion that this discharge through the Fallopian tubes is the method of cure which Nature employs in a large number of cases.

4. The case of double ovariotomy, by Dr. Peaslee, is a very remarkable one. The adhesions were very extensive and strong, and required great force to break down. The bleeding was very free. The omentum was everywhere firmly adherent to the tumour. The tumour of the left ovary, the main one, was polycystic. The right ovary being also diseased, of the size of a pullet's egg, was removed. "Perhaps a hundred vessels in the omentum were bleeding, and there was about a pint of blood in the peritoneal cavity." Many ceased bleeding on exposure to the air. Ligatures of fine silk were applied to more than a dozen; these were cut close and left in the peritoneal cavity. Torsion was used to many others. The wound was closed by silver sutures, long needles, and superficial silk sutures. The patient had been nearly five hours under the influence of ether; opium was given freely. On the seventh day there were evident signs of blood-poisoning. Dr. Peaslee therefore injected into the abdomen a pint of blood-warm water, and washed out over half a pint of pretty-thick bloody matter. These injections were repeated two or three times a day, through a period of seventy-eight days. The fluid injected sometimes consisted of one quart of water with two drachms of liquor sodæ chlorinatæ, and sometimes of a weak solution of common salt. Dr. Peaslee relied much also upon quinine, and beef-tea, and brandy enemata. At the end of ninety-four days the last ligature was removed, and the patient was considered to have recovered.

[This method of removing foul matter from the abdominal cavity, and of counteracting septicæmia by injections, seems well worthy of attention.—R.B.)

5. Dr. de Latour relates a case in illustration of a practice pursued by him of treating peritonitis by covering the skin of the abdomen with a coat of collodion and castor-oil, forming an investment impermeable to the air. His plan is based on the theory that "inflammation has for its element animal heat, of which it is nothing more than the local exaggeration;" this development of animal heat, he says, is arrested if the contact with air is cut off. Hence the

utility of the impermeable covering. The case cited is certainly striking. In a young woman, two ovarian abscesses successively burst into the abdominal cavity; two explosions of peritonitis ensued; purulent infection followed, producing nine distinct attacks of phlebitis; a third peritonitis then appeared. Each of these attacks was subdued, and the patient ultimately recovered under the persistent application of the impermeable covering.

III. Labour.

1. *On Eclampsia.* By Dr. Rosenstein. (Mon. f. Geburtsk., June, 1864.)
2. *A Case of Eclampsia, without Uræmic Intoxication.* By Prof. Dohrn, of Marburg. (Mon. f. Geburtsk., July, 1864.)
3. *Case of Rupture of the Uterus, in which Gastrotomy was successfully performed.* By R. W. Crighton, M.D. (Edinb. Med. Journ., Aug. 1864).
4. *Case of Cæsarian Section, with Successful Result to Mother and Child.* By J. W. Anderson, M.D., Jamaica. (Edinb. Med. Journ., July, 1864.)
5. *Transfusion in a Case of Hæmorrhage after Delivery.* By Dr. Weickert. (Deutsche Klinik, 23, 1862.)
6. *New Instruments for the Operation of Embryotomy.* By M. Mattei. (L'Union Méd., 71, 1864.)
7. *Case of Extra-uterine Gestation.* By Dr. Alfred Ott. (Prag. Med. Wochenschr., 12, 1864.)
8. *Clinical Report of the Lying-in Hospital of Trient for the Year* 1861-2. By V. Helly. (Mon. f. Geburtsk., July, 1864.)

1. Dr. Rosenstein, in an interesting analysis of the causes of puerperal convulsions, endeavours to show that there are two essential conditions: 1st, a thinning of the blood-serum; 2ndly, an increased pressure in the aortic system. He cites Traube, as showing that in almost every case of uræmic symptoms, anæmia, with œdema of the brain, flattening of the convolutions, and occasionally hæmorrhagic spots in the brain-substance, were found. Dr. Rosenstein adopts this as the essential condition of puerperal convulsions. He denies the theories of urea-poisoning, and of poisoning by the conversion of urea into carbonate of ammonia. His theory, he observes, does not necessarily associate the presence of albumen in the urine with convulsions.

2. Professor Dohrn relates in detail a case of eclampsia, which he contends was not caused by uræmic intoxication. It occurred in a primipara, aged twenty-six, who entered the hospital in good health. Labour had progressed naturally through the first stage. Urine drawn by catheter at this time was quite free from albumen. Labour hanging, the forceps was applied under chloroform. Hæmorrhage followed birth. A few hours afterwards, the patient was found in violent convulsions. No characteristic symptom was wanting. Fifteen fits occurred, and she died on the third day.

Autopsy.—Surface of the brain vascular; the substance not hyperæmic. A quantity of muddy-brown fluid was found in the left pleura. The source of this was a perforation of the stomach from post-mortem digestion, the gastric solvent having also perforated the diaphragm. Kidneys healthy. The blood was carefully examined. It contained a trace of urea only. The urine drawn at frequent intervals during the illness was examined. *The first appearance of albumen was after the second fit.* Albumen was thenceforward always found. The quantity of urea underwent no diminution.

Dr. Dohrn contends that the history and autopsy alike negative the idea of uræmia as a cause of the convulsions. The patient, he says, was quite healthy whilst in labour; there was no albumen in the urine until after the second fit; the albumen he regards as *a consequence* of the eclampsia. The perspiration had been found acid.

3. Dr. Crighton's case of gastrotomy on account of rupture of the uterus is very interesting. A woman had borne three dead children. There was pelvic contraction, and delivery in her fourth pregnancy by induction of premature labour was advised, but not accepted. Being at term, rupture occurred. The patient felt a "distinct snap" with her last pain, blood flowed from the vagina, the presenting part receded; pulse 120. Gastrotomy was performed about four hours after the rupture. About a pint and a half of dark-coloured bloody fluid escaped, and the child was found lying with its head downwards, resting on the firmly-contracted uterus. It was removed, and the placenta also, which was lying under the child loose. The uterus was well contracted; the line of rupture was almost directly transverse about the junction of the body with the cervix, and covered by a layer of coagulated blood. Several large clots were removed. The edges of the wound were accurately brought together by twisted sutures, or long acupressure needles, passed through the peritoneum. Acute jaundice set in on the second day. She ultimately recovered completely.

4. The subject of Dr. Anderson's Cæsarean section was a black girl. The author says that should he have again occasion to perform the operation, he would first rupture the membranes *per vaginam*, to obviate the escape of liquor amnii into the peritoneal cavity.

5. Dr. Weickert relates a successful case of transfusion. The patient was forty-three years old, and suffered from profuse loss of blood after her tenth labour. The symptoms described indicate extreme anæmia. The vein was bared for half an inch and pierced with a trocar, the object being to have an opening exactly large enough for the purposes of injection. The canula was secured by passing a thread under the vein by means of a needle. Thus an assistant could support the canula *in situ*. The blood for injection was not sucked into the syringe, but poured in. Portions were driven into the vein of the patient, until coagula obstructed the tnbe. The patient recovered.

6. Dr. Mattei proposes a new perforator, which is, he says, more simple than the trepans, scissors, and augers in use. Having perforated, he then passes into the cranium an *endotome*, which consists of scissors having short-curved, very strong blades, worked by long, powerful crossing handles, resembling Nägele's perforator; this instrument will break up the base of the skull. Then he has a pair of strong forceps, which, he says, will seize the head more effectually than the cephalotribe, for further crushing and extraction.

7. Dr. Ott's Case of Extra-uterine Gestation.—A woman, aged thirty-five, had borne one child eight years before. Normal menstruation was suspended five months; a swelling had formed in the right inguinal region. At the third month profuse hæmorrhage and abortion took place, but the swelling remained. Shiverings, abdominal pains, and vomiting set in. Hectic and emaciation followed, and death. *Autopsy:* Five quarts of dark grumous matter were found in the abdomen; an embryo of about four months was loose in the fluid described. The placenta adhered in Douglas's sac partly to the body of the uterus, partly to the right tube, which had burst in its middle. (An interesting feature of this case is the simultaneous uterine and extra-uterine pregnancy.)

8. In the small Lying-in Hospital of Trient, during the year 1861–2, 201 labours took place. Of this small number 27 fell ill of puerperal fever, and 14 died. One more woman died of convulsions. The hospital was closed to arrest the plague, the most various processes of disinfection and prophylaxis having been tried in vain. Dr. v. Helly states that the patients were not overcrowded at the time of the outbreak. Cadaveric poison could not rank as a

cause, since the midwives were not engaged in anatomical studies, and the assistant-physicians exercised the strictest cleanliness after the rare post-mortem examinations made by them.

IV. The Fœtus.

1. *On the Breathing of Children before Birth.* By Dr. Boehr. (Mon. f. Geb., Dec., 1863.)
2. *On Meningeal Hæmorrhages in New-born Children.* By Dr. E. Hervieux. (L'Union Méd., July, 1864.)

1. Dr. Boehr has made fresh researches into the important question of the breathing of children before birth. Amongst his results, the following deserve record. He found that in the great majority of all prematurely-breathing children, and, notwithstanding the most energetic attempts at respiration, there was no trace of air in the lungs. Dr. Boehr's cases embrace 10 in which the child lived on; 57 in which the child was dead born; and 10 in which the child was born dying. In all the cases examined after death there was hyperæmia of the pectoral organs. Referring to the doctrine that petechial sugillations on the serous membranes are the most common and most constant appearances of asphyxia, he says, from positive observation, that these may be absent in cases of the most undoubted fœtal asphyxia and drowning. His tables show that 18 times out of 75 dissections there were no petechial sugillations, and these were absent in cases where the placental circulation was interrupted from the most different causes.

2. Dr. Hervieux describes the results of numerous autopsies of cases of meningeal hæmorrhage in new-born children. He concludes that they establish the existence of a hæmorrhagic diathesis, which spares none of the principal viscera. The symptoms observed during life were: torpor, immobility of the patient, a feeble cry; in a certain number of cases sclerematous rigidity was added; then contraction ensued in the upper or lower extremities; sometimes the trunk, neck, and head shared in the tetanic stiffness. The patient in this latter case appears as if spitted from head to foot by a rigid rod. When the contraction is thus general, the spinal meninges, as well as the encephalic, are struck with hæmorrhage. Tonic convulsions are much more rare than contraction; paralysis of one side of the face or body.

IV. Summary.

The following memoirs are cited by title only, want of space preventing analysis:—

On a Case of Obstructed Labour from Unruptured Hymen. By G. H. Featherston. (Australian Med. Journal, Jan., 1864.)

Pregnancy notwithstanding Impossibility of Penetration. By Prof. Scanzoni. (Allg. Wien med. Zeit., 1864.)

Bursting of a Varix in the Ovary; Death in four hours from Collapse: Acute Anæmia. By Dr. Horing. (Wurzb. Corr. Blatt, 1863.) The abdomen held six pounds of blood.

Observations on Shoulder Presentations of the Fœtus. By John Christie, M.D. (Edinburgh Med. Journal, July, 1864.)

Case of Cæsarean Section in a Primipara on account of Distorted Pelvis, with Successful Result. By Dr. Boissarie. (L'Union Méd., 93, 1864.)

The Nerves and Movements of the Uterus. A Critical Revision (of the Writings of F. A. Kehrer, Giessen, 1864, and F. Frankenhaüser, 1864.) By Dr. Spiegelberg. (Monatsschr. f. Geburtsk., July, 1864.)

On the Motor-nerves of the Uterus. By Theod. Körner. (Centralbl. f. d. Med. Wissenschaften, Berlin, 1864.)

On Pregnancy with a Blighted Ovum. By Dr. Hardy. (Dublin Quarterly Journal of Medical Science, August, 1864.)

Two Cases of Carcinoma of the Fundus Uteri. By Dr. Saexinger. (Monatsschr. f. Geburtsk., July, 1864.)

On the Entrance of Air into the Uterus in the Course of Lingering Labours. By F. Winckel. (Monatssch. f. Geb., July, 1864.)

Case of Acute Atrophy of the Liver in a Pregnant Woman. By C. D. Mall. Wiener Medizinal-Halle, No. 7, 1864.)

On the Knowledge of the Mode of Death of the Fœtus in Premature Detachment of the Placenta. By B. S. Schultze. (Jen. Zeit. f. Med. I., 2, 1864.)

Case of Cæsarean Section—Birth Obstructed by Enormous Hydatid Cyst of Liver. By M. T. Sadler, M.D. (Med. Times and Gazette, Aug., 1864.)

Ova in Ovarian Cysts. By T. Spencer Wells, Dr. C. G. Ritchie, and Dr. Woodham Webb. (Med. Times and Gazette, Aug., 1864.)

Twelve Cases of Ovariotomy. By Dr. Th. Keith. (Edinburgh Med. Journal, August, 1864.)

On the Induction of Premature Labour in the Sickness and Vomiting of Pregnancy, with Cases (Two). By Dr. Hardy. (Dublin Quar. Journal of Medical Science, Aug., 1864.)

Some Observations on the Administration of the Vapour of Chloroform in Obstetric Practice. By Dr. Sinclair. (Dublin Quarterly Journal of Med. Science, August, 1864.)

Case of Fibro-Cystic Tumour of the Uterus. By T. S. Wells. (Dublin Quarterly Journal of Medical Science, August, 1864.)

CONTRIBUTIONS TO MEDICAL LITERARY HISTORY.

ADVERSARIA MEDICO-PHILOLOGICA.

When the Writer first began to look at the old medical authors (now many years ago), he at once felt the want of some work to explain the technical terms employed by them. It is unnecessary to criticise particularly each of the existing lexicons, as nothing is easier than to pick out faults in works of this kind, however excellent they may in reality be;[1] and therefore he will merely say that he began to make a collection of medical technical terms for himself, with a reference to at least one passage where each was to be found. A vague intention was at one time entertained of rendering this collection of words complete, and then publishing it in the form of a lexicon. This idea has long been abandoned; but as the collection of words is extensive, and the references (for the most part) belong to works or editions that did not exist when the old lexicons were compiled, it has been thought that a selection of some of the words may possibly be worthy of being put on record for the use

[1] The following are the works alluded to :—

H. Stephani 'Dictionarium Medicum.' Paris, 1564. 8vo.

J. Gorræi 'Definitiones Medicæ.' Paris, 1564. Fol.

A. Foësii 'Œconomia Hippocratis.' Genev., 1662. Fol.

B. Castelli 'Lexicon Medicum Græco-Latinum.' Genev., 1746. 4to.

J. Hebenstreit 'Exegesis Nominum Græcorum quæ Morbos definiunt.' Lips., 1751. 4to.

L. A. Kraus 'Kritisch-etymologisches medicinisches Lexicon.' Götting., 1844.

S. Blancardi 'Lexicon Medicum,' edited by C. G. Kühn. Lips., 1832. 8vo, 2 vols.

of future lexicographers. Only let them bear in mind that the following collection of words does not pretend to completeness in any way. It is very far from being a complete collection of Greek medical terms, for all botanical and chemical words have been designedly omitted; neither is the treatment of each word to be considered complete, for no doubt various meanings are passed over, and probably better passages might frequently be quoted. It is simply a contribution (and that a very imperfect one) to Greek medical technology; but even in its present form it will probably not be found entirely useless.

There will be found but few references to Hippocrates, as these are for the most part rendered superfluous by the excellent 'Œconomia Hippocratica' of Foes. It is not often that former writers have been referred to, both in order to avoid the appearance of captious and unnecessary controversy, and also in order to save space; but it is believed that no important assistance has in any case been received from other writers without due acknowledgment.

ἀβάπτιστον, or *ἀβάπτιστον τρύπανον*, a sort of trepan, with a ring or knob a little above the extremity, in order to prevent its penetrating the cranium too suddenly, and so injuring the brain. Hence the name, *διὰ τὸ μὴ βαπτίζεσθαι*, says Galen,[1] because it could not be suddenly *plunged* or *immersed* into the brain. The same explanation is given by Paulus Ægineta,[2] and also by Albucasis,[3] who translates this and numerous other passages from Paulus Ægineta almost literally.[4]

ἀγγειολογία does not signify *angiology* in the modern sense of the term, but the section of the temporal vessels. There is a chapter on the subject in Aëtius,[5] and also in Paulus Ægineta,[6] which latter is almost translated by Albucasis.[7] The operation is described by Celsus,[8] who uses the phrase "venas legere," to *select the veins* (for section), but not the word *ἀγγειολογία*. Oribasius uses the word,[9] and refers to a chapter on the subject, which is no longer extant. It is found also in Leo,[10] where it is joined with *ἀρτηριοτομία*, and apparently distinguished from it; and in the treatise called 'Introductio,' among Galen's works.[11]

ἀγγεῖον, *a vessel* in the human body, a receptacle, applied to organs of different shapes, as *ἀγγεῖον φλεβῶδες*, to a renal vein,[12] to a splenic vein;[13] *ἀγγεῖον χολῆς*, to the gall-bladder;[14] *ἀγγεῖον κυητήριον*, to the uterus.[15]

ἀγγεῖα, in the plural, is probably only applied to vessels of a tubular form, principally to the veins and arteries.

[1] 'De Meth. Med.,' vi. 6, tom. x. p. 447, l. 11.

[2] Lib. vi. cap. 90, p. 376, l. 5, ed. Briau.

[3] Lib. iii. cap. ii. p. 534, ed. Channing (p. 283, ed. Leclerc).

[4] An amusing story connected with this word is told by Jo. Langius ('Epist. Medic.,' lib. i. p. 29, quoted by C. G. Kühn, 'Opusc. Acad. Med. et Philol.,' vol. ii. p. 262): "Cum plures medicos, quibuscum in convivio convenerat, quæreret, num *τρέπανον ἀβάπτιστον* vidissent, hi, ultimæ vocis Græcæ sensum ignorantes, confessi sunt frustra quæri in Germaniâ *τρέπανα ἀβάπτιστα*, in quâ tantum pueri et campanæ baptizentur. Quibus cum Langius regereret, se Romæ tale instrumentum apud Vigonem, Pontificis Julii chirurgum, vidisse, celeriter respondebat, qui ex illis plurimum sapere sibi videbatur, Romæ ob præsentiam Summi Pontificis omnino facile illa instrumenta baptizari posse."

[5] Tetr. ii., Serm. 3, cap. 93, p. 338, ed. H. Steph.

[6] Lib. vi. cap. 5, p. 92, ed. Briau.

[7] Lib. ii. cap. 3, p. 62, ed. Leclerc.

[8] Lib. vii. cap. 7, § 15.

[9] 'Coll. Med.' xlv. 18, § 32, tome iv. p. 43, l. 3, ed. Daremberg.

[10] 'Consp. Med.,' ii. 2, in Ermerins, 'Anecd. Med. Gr.,' p. 111, l. 15.

[11] Cap. 19, tom. xiv. p. 781, l. 9; p. 784, l. ult.

[12] Galen, 'De Usu Part.,' lib. xiv. cap. 7, tom. iv. p. 169, l. 14.

[13] Id. ibid. iv. 15, tom. iii. p. 317, l. i.

[14] Rufus Ephes., p. 39, l. 9.

[15] Galen, 'Defin. Med.' tom. xix. p. 362, l. 12.

ἀγγεῖα μεσαραϊκά, the mesenteric vessels,[1] in general.

ἀγγεῖα σιαλόχοα, the salivary ducts.[2]

ἀγγεῖα σπερματικά, the spermatic vessels, used somewhat indefinitely, and not always in the same sense, to signify all or part of the vessels connected with the secretion of the seminal fluid in the male; applied also sometimes to the female.[3] Sometimes the words are used in the singular number.[4]

ἀγκιστροειδής, *anchor-shaped*, is used by Rufus Ephesius[5] as synonymous with *ἀγκυροειδής*, and is applied to one of the processes of the scapula, probably that which is now called the *coracoid* process.

ἀγκύλη generally means *the bent arm*, but sometimes *the ham.*[6] It is also used as synonymous with *ἀγκύλωσις*,[7] and is explained by Celsus[8] to mean "recenti cicatrice contractus articulus." The word is used by Dioscorides, Lucius,[9] and Galen.[10]

ἀγκυλοβλέφαρος means a person affected with ankyloblepharon, that is, an adhesion of the eyelids, either to each other or to the eyeball itself.[11] The affection is mentioned by Aëtius,[12] Paulus Ægineta,[13] and the author of the 'Introductio seu Medicus,' attributed to Galen;[14] but neither of these writers calls it by the name *ankyloblepharon.* Aëtius and Pseudo-Galen call it *ankylosis*, and it seems doubtful whether the word *ἀγκυλοβλέφαρον* occurs as a substantive in any ancient author, now that it has been expunged from Celsus, where the best modern editors read *ἀγκυλοβλεφάρους*.[15]

ἀγκυλόγλωσσος is an adjective, and means a person affected with ankyloglosson.[16] *τὸ ἀγκυλόγλωσσον πάθος* means the affection called *ankyloglosson*, that is, an adhesion of the tongue to the adjacent parts—tongue-tie.[17] The affection is mentioned by Celsus,[18] but without any distinct name.

ἀγκύλωσις is used by the author of the 'Introductio seu Medicus' attributed to Galen,[19] to signify what is now called *ankyloblepharon*. Paulus Ægineta[20] uses the word as synonymous with *ἀγκύλη*, and nearly in the modern sense of ankylosis, or stiff joint.[21]

[1] Theophilus, 'De Corp. Hum. Fabr.' ii. 7, § 9, p. 68, l. 5.

[2] Oribasius, xxiv. 8, § 4, tom. iii. p. 310, l. 14, ed. Daremberg.

[3] See Rufus Ephes., p. 39, l. 21; p. 40, ll. 4, 7; Galen, 'De Uteri Dissect.,' cap. 9, tom. ii. p. 900, l. 8; 'De Usu Part.,' xiv. 14, tom. iv. p. 208, ll. 12, 16; p. 209, l. 14; p. 210, l. 4; Theophilus, 'De Corp. Hum. Fabr.,' ii. 15, § 2, p. 86, l. 9; Leo, 'Consp. Medic.,' vi. 8, in Ermerins, 'Anecd. Med. Gr.,' p. 195, l. 2.

[4] Galen, 'De Usu Part.,' xiv. 10, 14, tom. iv. p. 186, l. penult.; p. 208, l. 8; p. 209, l. 9.

[5] P. 67, l. penult. ed. Clinch.

[6] Pseudo-Galen, 'Introd.,' c. 10, tom. xiv. p. 708, l. 4.

[7] Paulus Ægineta, lib. iv. cap. 55.

[8] Lib. v. cap. 18, § 28.

[9] Quoted by Galen, 'De Compos. Medic. sec. Gen.,' vii. 6, tom. xiii. p. 968, l. 7; p. 969, l. i.

[10] 'Comment. in Hippocr. "De Artic.,"' iii. 96, tom. xviii. A., p. 623, l. 12.

[11] Celsus, lib. vii. cap. 7, § 6.

[12] Tetr. ii. Serm. 3, cap. 64, p. 327, ed. H. Steph.

[13] Lib. vi. cap. 15.

[14] Cap. 16, tom. xiv. p. 772, l. 16.

[15] See Kühn's 'Opusc. Acad. Med. et Philol.,' vol. ii. p. 369.

[16] Aëtius, tetr. ii. Serm. 4, cap. 36, p. 388, ed. H. Steph.

[17] Paulus Ægineta, lib. vi. cap. 29.

[18] Lib. vii. cap. 12, § 4.

[19] Cap. 16, tom. xiv. p. 772, l. 16.

[20] Lib. iv. cap. 55.

[21] These last words are frequently (perhaps generally) written in English, *Anchylosis*, &c. (with *ch*), which is manifestly wrong, as the Greek letter is *κ*, not *χ*. The form *Ancylosis*, &c., is in strict accordance with the usual English mode of spelling Greek words containing a *κ*, but is inconvenient on account of pronunciation, the

ἀγκυροειδής, *anchor-shaped*, applied by Dioscorides[1] to the boughs of one of the species of the *chamæpitys*. ἀγκυροειδὴς ἀπόφυσις in Galen[2] is synonymous with ἀπόφυσις κορακοειδής, and signifies one of the processes of the scapula, probably that which is still called the *coracoid* process. Rufus Ephesius[3] uses the word in the same sense, as synonymous with ἀγκιστροειδής; and Oribasius[4] transcribes one of the passages of Galen referred to. In another passage Galen[5] seems to make a distinction between the ἀπόφυσις ἀγκυροειδής and the ἀπόφυσι κορακοειδής.

ἀγκών, a Hippocratic word[6] synonymous with the Attic ὠλέκρανον and the Sicilian-Doric κύβιτον.[7] It properly signifies the process of the ulna, called the *olecranon*, but is often used for the whole elbow generally. The word is found in Aretæus,[8] Rufus Ephesius,[9] Galen,[10] Oribasius,[11] Apollonius Citiensis,[12] and Theophilus Protosphaatrius.[13]

ἀθήρωμα is used in the modern sense of the word—viz., a tumour containing a soft substance like ἀθήρη, *pap* or *gruel*, by Celsus,[14] Galen,[15] and other ancient writers.[16] The word is sometimes written ἀθήρωμα (which is the only form recognised by Liddell and Scott in their lexicon), but more frequently ἀθέρωμα, at least in the present copies of the Greek medical writers. The spelling of ἀθάρη, ἀθέρη, ἀθήρη, seems also doubtful.

αἱμοπτυϊκος, a person affected with hæmoptysis,[17] or spitting of blood. The word *hæmoptysis* is probably of modern invention, though the expressions αἵματος πτύσις and ἡ τοῦ αἵματος πτύσις are used by Hippocrates[18] and Galen,[19] but not always in the strict modern sense of hæmorrhage from the lungs. In

c before *y* having generally the *soft* sound of *s*. The best mode of escaping the difficulty is by following the example of the French and German writers, and spelling the words with a *k* (*ankylosis*, &c.), and this is the mode now adopted by some of the most correct English writers also.

[1] 'De Mat. Med.' iii. 166, tom. i. p. 501, ed. Sprengel.

[2] 'De Musc. Dissect.' tom. xviii. B. p. 975, ll. 14, 15; 'De Anat. Admin.' i. 11, tom. ii. p. 275, l. 1; 'De Oss.' c. 14, tom. ii. p. 766, l. 18; 'Comment. in Hippocr. "De Artic."' i. 2, tom. xviii. A. p. 306, l. 13.

[3] P. 67, l. penult. ed. Clinch.

[4] 'Coll. Med.' xxv. 13, tome iii. p. 411, l. 5, ed. Daremberg.

[5] 'De Usu Part.' xiii. 12, tom. iv. p. 133, l. 1.

[6] 'De Fract.' §§ 3, 38, tome iii. p. 426, l. 3, p. 544, l. 13; 'De Artic.' § 17; 'Mochl.' § 7, tome iv. pp. 130, 352; 'De Loc. in Hom.' § 6, tome vi. p. 286, l. 16, ed. Littré.

[7] Juliux Pollux, 'Onom.' ii. 4, § 141; Rufus Ephes. p. 29, l. 16; Galen, 'De Usu Part. ii. 2, 14, tom. iii. p. 92, l. 7; p. 142, l. 10; 'De Motu Musc.' ii. 3, tom. iv. p. 430, l. 13; 'Comment. in Hippocr. "De Fract."' ii. 66, tom. xviii. B. p. 512, l. 2.

[8] 'De Caus. et Sign. Morb. Chron.' ii. 13, p. 179, l. 4.

[9] P. 50, l. 14.

[10] 'Introd.' c. 10, tom. xiv. p. 704, l. 3; 'De Musc. Diss.' tom. xviii. B. p. 975, l. 2; p. 976, l. 14.

[11] 'Coll. Med.' xxv. 43, §§ 1, 3, tome iii. p. 454, l. 12, p. 455, l. 14.

[12] In Dietz, 'Schol. in Hippocr. et Gal.' vol. i. pp. 14, 15, 16, 17.

[13] 'De Corp. Hum. Fabr.' p. 31, l. 14; p. 33, ll. 7, 11; p. 35, l. 8, ed. Oxon.

[14] Lib. vii. cap. 6.

[15] 'De Meth. Med.,' xiv. 12, tom. x. p. 985, l. 6; 'De Tumor. præt. Nat.,' cap. 5, tom. vii. p. 718, l. penult.; 'Defin. Med.,' cap. 375, tom. xix. p. 440.

[16] Aëtius, tetr. ii. serm. 3, cap. 83; tetr. iv. serm. 3, cap. 7, pp. 333, 743, ed. H. Steph.; Paulus Ægineta, lib. iv. cap. 34; lib. vi. cap. 36; Joannes Actuarius, 'De Meth. Med.,' ii. 12, p. 190, ed. H. Steph.; Leo, 'Consp. Medic.,' vii. 12, in Ermerins, 'Anecd. Med. Gr.,' p. 210.

[17] Andromachus, quoted by Galen, 'De Compos. Medic., sec. Loc.,' vii. 4, vol. xiii. pp. 78, 79, 80; Cælius Aurelianus, 'Morb. Chron.' iii. 2, § 35, p. 442.

[18] 'Aphor.' iii. 29; vii. 15, tome iv. pp. 500, 580, ed. Littré.

[19] 'De Locis Affect.' iv. 11, tom. viii. p. 287, l. 7; 'Comment. in Hippocr., "Epid. I."' i. 18, tom. xvii. A. p. 61, l. 5.

one passage[1] Galen applies the words to hæmorrhage from the mouth, &c., from the stomach, &c., and from the lungs, &c. Kühn refers to Galen[2] as an authority for the word *αἱμόπτυσις*; but he probably means *αἱμοπτυϊκός*, which suits his purpose quite as well as *αἱμόπτυσις*.[3]

αἱμορραγία, rendered "sanguinis fluor" by Cælius Aurelianus,[4] means hæmorrhage in general from any part of the body.[5] When, however, in Hippocrates no organ is specified, and the word is used alone, Galen[6] says that epistaxis is meant. Accordingly, in the passage of Hippocrates referred to by Galen, the word is thus translated by Littré,[7] Daremberg,[8] and Ermerins,[9] but by Adams[10] it is rendered simply *hæmorrhage*.

αἱμορροῒς is used to signify not only *piles*, or a flow of blood from the veins of the rectum, but also from those of other parts of the body.[11] According to Galen,[12] it differs from *αἱμορραγία* in being a less violent and copious flow of blood, and sometimes it is applied to tumours without any bleeding at all.[13] When applied to the female organs of generation,[14] Adams thinks that it comprehends polypus and all other tumours about the uterus.[15]

ἄκανθα is applied sometimes, and perhaps originally and more properly, to the spinous process of a vertebra;[16] sometimes to the series of spinous processes,[17] when it is sometimes joined to *ῥάχις*;[18] sometimes to the whole collection of vertebræ,[19] when it is apparently synonymous with *ῥάχις*.[20] The last two senses of the word it is not always easy to distinguish. It is sometimes also applied to the spine of the scapula.[21]

ἀκατονόμαστος χόνδρος is the name given by Theophilus[22] to the cricoïd cartilage of the larynx. The name is probably derived from Galen,[23] who sometimes calls the cricoïd cartilage simply *ὁ δεύτερος*.[24] Suidas also calls it *ἀνώνυμος*.[25]

ἀκμαστικὸς σύνοχος signifies a species of continued fever, in which the same amount of heat continues throughout the attack.[26] It is synonymous with *ὁμότονος*, and is distinguished from *ἐπακμαστικός* and *παρακμαστικός*.

[1] 'Quomodo Morb. Simul. sint Deprehend.,' tom. xix. p. 2, l. 2.
[2] 'De Comp. Med. sec. Loc.' vii. 4, p. 546, tom. xiii., ed. Chart.
[3] 'Opusc. Acad. Med. et. Philol.,' vol. ii. p. 338.
[4] 'Morb. Chron.' lib. ii. cap. 9, &c.
[5] See Index to Kühn's Galen, in 'Hæmorrhagia.'
[6] 'Comment. in Hippocr., "Epid. I."' i. 10, tom. xvii. A. p. 50, l. 1.
[7] 'Œuvres d'Hipp.,' tome ii. p. 600. [8] 'Œuvres Choisies d'Hipp.,' p. 412.
[9] 'Hippocr. Opera,' tom. i. p. 160. [10] 'Genuine Works of Hipp.' p. 352.
[11] Celsus, lib. ii. cap. 1, p. 31, ed. Daremberg.
[12] 'Defin. Med.' cap. 460, tom. xix. p. 456.
[13] Aëtius, tetr. iv. serm. ii. cap. 5, p. 688, c., ed. H. Steph.
[14] See Celsus, vi. 18, § 9; Paulus Ægineta, iii. 75; vi. 71.
[15] Paul. Ægin., vol. i. p. 646.
[16] Galen, 'De Anat. Admin.,' iv. 6, 7, tom. ii. p. 447, l. 2; p. 455, l. 11; 'De Oss.,' cap. 8, tom. ii. p. 758, l. 8.
[17] Galen, 'De Usu Part.,' xii. 15, tom. iv. p. 61, ll. 8, 13; Theophilus, 'De Corp. Hum. Fabr.,' v. 5, § 6, p. 193, l. 16.
[18] Galen, 'De Anat. Admin.,' iv. 6, 10, tom. ii. p. 451, l. 1; p. 467, l. 5; Theophilus, 'De Corp. Hum. Fabr.,' v. 5, § 3, p. 193, l. 2.
[19] Rufus Ephesius, p. 52, l. 7.
[20] Hippocr., 'De Artic.,' § 14, tome iv. p. 122, l. 11, ed. Littré; Galen, 'De Anat. Admin.,' v. 10, tom. ii. p. 530, ll. 6, 9, 14.
[21] Galen, 'De Anat. Admin.,' iv. 2, 10, tom. ii. p. 428, l. 10; p. 468, l. 4; p. 469, l. 18.
[22] 'De Corp. Hum. Fabr.,' iii. 14, § 1, p. 110, l. 4; 15, § 2, p. 111, l. 12.
[23] See 'De Anat. Admin.,' lib. xi. in the Arabic Version.
[24] 'De Usu Part.,' vii. 11, tom. iii. p. 552, l. 9. [25] 'Lex.' in v. *φάρυγξ*.
[26] Galen, 'De Meth. Med.,' ix. 4, tom. x. p. 615, l. 10; Leo, 'Consp. Med.,' i. 3, in Ermerins, 'Anecd. Med. Gr.,' p. 91, l. 13.

ἀκμή, when applied to a disease, means the third stage, when it is at its height.[1] When applied to the life of man, it means the flower of his age. Hence the pimples that appear in the face about that time were called ἀκμαί in popular language.[2] The modern scientific name, *acne*, is generally stated to be a Greek word, ἄκνη, but the only passage where it occurs is (it is believed) in Aëtius, where it is manifestly a mere error of the press for ἀκμή: so that it seems probable that this typographical error is the sole origin of the term, which is now too commonly used to be ever altered.[3]

ἀκρόχειρον,[4] or ἄκρα χείρ,[5] generally means the *hand* properly so called, forming part of the whole upper extremity, to which the word χείρ is sometimes applied.[6] Sometimes it may especially signify the *fingers*, and some persons so translate it in the account of the Plague of Athens by Thucydides;[7] but in this passage also the sense given above is quite as likely to be the true one, and *manus*, not *digitus*, is the word used by Lucretius[8] in his poetical description of the Plague, which is in some places almost translated from Thucydides.

ἀκρόπους,[9] or ἄκρος πούς,[10] after the analogy of the preceding word, mean generally the *foot*, rather than the *toes*. In many passages one of these senses may possibly be as good as the other, but there are probably not many in which the context absolutely requires the meaning of *toes* to be applied to the words, excluding the other signification.

τὰ ἀκροσφαίρια τῶν δακτύλων, *the tips of the fingers*.[11] The word is not to be found in Liddell and Scott's Greek Lexicon, nor in any of the medical dictionaries that I have seen.

ἀκροχορδών, a Hippocratic word,[12] signifying *a pediculated or pendulous wart* having a narrow base, and thus distinguished from μυρμηκία, which has a broad base.[13] The derivation of the word is given by Paulus Ægineta,[14] because it is like ἄκρῳ χορδῆς, *to the end of a cord*.

[1] Galen, 'De Cris.,' i. 8, tom. ix. p. 581, l. 3; 'De Opt. Sectâ,' cc. 32, 35, tom. i. p. 193, l. 4; p. 195, l. 15; Pseudo-Synesius, 'De Febr.,' pp. 74, 250. See also Hippocr. 'Aphor.,' ii. 30, tom. iv. p. 478, ed. Littré.

[2] Aëtius, viii. 13, p. 152 B., ed. Ald. (p. 372, ed. H. Steph.); Cassius Felix, 'Probl. Phys. et Med.,' c. 33, in Ideler's 'Med. et Phys. Græci Min.,' vol. i. p. 155; Julius Pollux, 'Onom.,' iv. § 194.

[3] See Notes to Rhazes 'On the Small Pox,' p. 143.

[4] Galen, 'De Usu Part.,' ii. 2, tom. iii. p. 91, l. 17.

[5] Galen, 'De Anat. Admin.,' i. 6, 9, tom. ii. p. 253, l. 16; p. 267, l. 9; Theophilus, 'De Corp. Hum. Fabr.,' i. 2, § 5, p. 4, ll. 3, 4.

[6] Galen, 'De Inæq. Intemp.,' cap. 2, tom. vii. p. 735, l. 3; Theophilus, 'De Corp. Hum. Fabr.,' i. 2, § 4, p. 4, l. 1; Rufus Ephes., p. 29, l. 21. See Note to Theophilus, *loco cit.*

[7] Lib. ii. cap. 49, § 8. See Dean Ireland 'On the Plague of Athens,' &c., 1832, p. 6, and Dr. Collier's 'Hist. of the Plague of Athens,' 1857, p. 26.

[8] Lib. vi. v. 1008.

[9] Theophilus, 'De Corp. Hum. Fabr.,' i. 19, § 3, p. 42, l. 1.

[10] Galen, 'De Anat. Admin.,' iii. 1, tom. ii. p. 342, l. 16; 'De Usu Part.,' iii. 5, tom. iii. p. 188, ll 8, 10; Theophilus, 'De Corp. Hum. Fabr.,' i. 18, § 1, p. 39, l. 1.

[11] Theophilus, 'De Puls.,' in Ermerins, 'Anecd. Med. Gr.,' p. 15, l. ult.

[12] 'Aphor.,' iii. 26, tome iv. p. 498, ed. Littré.

[13] Celsus, ii. 1, v. 28, § 14, pp. 30, 216, ed. Daremberg; Galen, 'De Meth. Med.,' ii. 2, tom. x. p. 84, l. 11; id. 'Defin. Med.,' c. 400, tom. xix. p. 444.

[14] Lib. iv. cap. 15, p. 63, l. 41; lib. vi. cap. 87, p. 95 B, l. 5, ed. Ald. See also Leo, 'Consp. Medic,' lib. vii. cap. 14, in Ermerins, 'Anecd. Med. Gr.,' p. 211; Aëtius, tetr. iv. serm. 2, cap. 3, p. 686 G; and Joannes Actuarius, 'De Meth. Med.,' ii. 11, p. 188 F, ed. H. Steph.

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