













TRANSACTIONS

OF THE

MEDICO-CHIRURGICAL SOCIETY

OF

EDINBURGH.

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INSTITUTED AUGUST 2. 1821.

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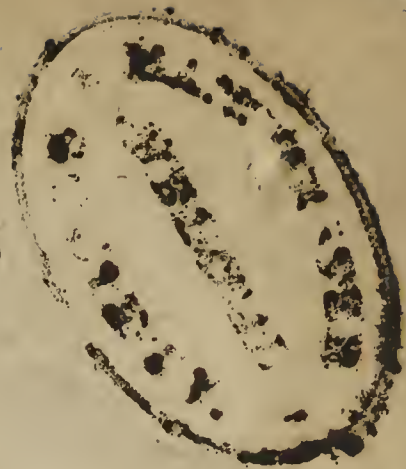
*WITH PLATES.*

EDINBURGH:

PRINTED FOR ADAM BLACK AND THOMAS IRELAND & CO.;  
AND LONGMAN, HURST, REES, ORME, BROWN & GREEN,  
AND T. & G. UNDERWOOD, LONDON.

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1824.



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## P R E F A C E.

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**T**HE Members of the Medical Profession in this country, are now generally aware of the advantages which result from associations of medical men, intended for the communication of facts, and the interchange of opinions on medical subjects, and for the collection and preservation of important practical observations, so frequently made by gentlemen whose avocations do not permit them to undertake separate publications.

It appeared to many of the practitioners and teachers of medicine in this city, that an association among themselves, similar to those which have conferred so much benefit on medical science in London and Dublin, was very desirable for their own gratification and instruction. And from the number of medical men, in all parts of the world, who have been initiated into their profession in this University, it may be hoped that the Society may become the depository of much more varied and ex-

tensive observations, than the resident members themselves can hope to furnish.

The expectations of the founders of the Society have been hitherto fully realized, in regard to the countenance given, and the information contributed, by the members on the spot ; but in order that the institution may become as extensively useful as they wish it to be, they must look for much assistance from their friends in other parts of the world.

Without presuming to dictate to such gentlemen as may be disposed to favour them with communications, the choice of their subjects, the Council of the Society take the liberty of suggesting, that many useful and important conclusions, regarding the history, causes, and treatment of diseases, may be drawn from a collection and comparison of the records of different medical charities ; and, in general, from statements of the experience of individuals, extending to large numbers of cases,—specifying the diseases treated, and more particularly the deaths that occur from each disease, at different times, in different situations and parts of the world,—with the ages of the patients, and the seasons of the year at which the cases occurred,—accompanied with short notices of the medical topography of the places where the observations are made, and of the habits of the people.

The greatest obstacle to the acquisition of important information by this means, has always been the variety of medical nomenclature; and it is therefore particularly desirable, that such comparative observations should be made by practitioners educated in the same school, and accustomed to the use of the same terms.

The important subject of Morbid Anatomy is another to which many valuable contributions may be made, without much difficulty, by the united exertions of individuals engaged in practice. Accounts of dissections of interesting cases, with short notices of the nature and progress of the symptoms, will always be acceptable to the Society. And a collection, such as may be made in no long time, of cases of this kind, recorded in the first instance without reference to any system or theoretical opinions whatever, and afterwards classified and arranged, may be of very great importance to Pathology.

Communications on these, or any other subjects connected with Medical Science, may be addressed to the Secretaries, or transmitted through any member of the Society.



As one of the cases of Melanosis, described in the paper of Messrs CULLEN and CARSWELL, and which occurred in the Clinical Ward of the Royal Infirmary, has been published in the London Medical Repository since the paper in this volume was printed off, it is necessary to state, that it was without the permission, and contrary to the intention, of the gentleman under whose care the patient was, that the case appeared in any other publication than the present.

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Several valuable donations of Books having been made, the donors will please to accept the best thanks of the Society. On a future occasion a regular list of the donations will be published along with the Transactions.



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CONTRIBUTIONS  
TO THE  
PATHOLOGY OF THE HEART.

By JOHN ABERCROMBIE, M. D.

(Read 5th December 1821.)

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I. *Inflammatory Affections.*

IT seems to be impossible to distinguish in practice, betwixt inflammation of the pericardium and inflammation of the membrane covering the heart; nor do I consider it as being of much practical importance. The probability is, that inflammation beginning in the one, so readily spreads to the other, as to constitute, at a very early period, the same disease. The affection occurs under various forms, and in some of them is very difficult of detection in its early stages. It may be acute or chronic, idiopathic or symptomatic; but, in all its forms, it is a disease of extreme danger. The following case is an example of acute, idiopathic carditis, or perhaps primarily pericarditis.

## CASE I.

A young lady, aged sixteen, came under my care on the 8th January 1812, affected with acute pain, which was referred to the pit of the stomach. It very much impeded respiration, and at times prevented the least attempt at taking a full breath. The breathing, consequently, was very short and quick, with extreme anxiety and restlessness; but there was no cough, and no vomiting. Pulse from 120 to 130. She was largely bled; and, in the course of a few days following, the bleeding was repeated seven or eight times. Blistering, digitalis, and the other usual remedies, were also employed in the most active manner, but with little effect upon the pain, which continued, with very little abatement, for nearly a fortnight, while active treatment could be carried no farther. During the whole of this period she was in constant, acute pain, with very short breathing, extreme restlessness, a good deal of delirium, and almost no sleep; the pulse generally 130. Still there was no cough. At length, in the third week, the pain abated, and she could take a full breath with very little uneasiness. Pulse 120. She then fell into a state resembling chorea, with convulsive agitations of the limbs, constant motion of the head, and wild rolling of the eyes. Delirium continued, which soon increased to such a degree, that for several days she was with difficulty kept in bed. She then did not complain

of any pain, and the breathing was natural; the pulse 120, and very small. By cold applications to the head, these symptoms subsided in a few days; and she then gradually recovered her usual health, except that her pulse continued more frequent than natural. She continued well till the 20th of April (the same year), when, having been exposed to cold and fatigue, she was seized as before, but the pain was more towards the left side. It greatly impeded respiration, and was accompanied with great anxiety and restlessness. By large bleeding, blistering, &c., she was very much relieved; so that, on the 25th, hopes were entertained that she was out of danger. But she then became suddenly worse, with severe dyspnoea, great anxiety, vomiting, and rapid sinking of the vital powers; and she died on the 26th.

*Dissection.*—The pericardium adhered to the heart, through its whole extent, by means of a very thick layer of coagulable lymph, which was interposed between them. It was soft, and easily separated. There was a deposition of the same kind on the outer surface of the pericardium, in some places nearly half an inch in thickness. The surface of the heart was dark coloured, and very vascular. The lungs were in some places inflamed and indurated. The other viscera were healthy.

In the two following cases, the symptoms were less acute, and in both of them extremely obscure.

## CASE II.

A boy, aged seven, in February 1819, had acute rheumatism, with symptoms of carditis, which were soon relieved by bleeding, and he enjoyed good health till November of the same year, when, after being feverish for some days, he was seized with pain of the left side, cough, and difficult breathing. For these symptoms, he was treated by an able and intelligent surgeon with repeated bloodletting, and the other usual remedies, and the local symptoms were speedily relieved; his pulse, however, continued extremely frequent. I saw him about ten days after the attack. He had then some cough, but it was slight; there was no pain, and no difficulty of breathing; there was no unusual pulsation in the thorax; the tongue was clean, and the appetite and bowels natural; but the pulse was from 120 to 130. His sleep was sometimes good, and sometimes disturbed. During some nights he had considerable cough, in others little or none. In this state he continued for a week; at times disposed to sit up in bed and amuse himself through the day; at other times more disposed to be quiet, but still without any symptom except the constant frequency of pulse. About the tenth day from the time when I first saw him (the twentieth of the disease), he complained of pain in the left side, which was referred to the upper part of the abdomen, as if in the region of the spleen. It was in-

creased by pressure, and he complained very much of pressure over the whole upper part of the abdomen. The breathing was a little oppressed; the pulse frequent and full. These symptoms had commenced during the night. Bloodletting, both general and topical, was employed freely through the day, and in the evening he was much relieved. He passed a quiet night, but on awaking in the morning, he was seized with slight convulsion. He then sunk into a low exhausted state, and died in half an hour.

*Dissection.*—The abdominal viscera were all sound, and the lungs quite healthy. The pericardium adhered to the heart through its whole extent, except a small portion at the lower and posterior part. The adhesion consisted, in some places, of a soft, gelatinous matter; in others, of a firm, reddish substance, like the substance of healthy granulations; but the whole was soft, and easily torn by the finger, and when it was cleared away, the anterior surface of the heart was covered with firm, irregular elevations, like small granulations.

### CASE III.

A boy, aged ten, had been for several years extremely delicate, being liable to cough and to diarrhoea, from slight exposure to cold, the diarrhoea sometimes proving tedious and untractable. In the end of March 1821, he had measles: the eruption

did not come out freely, but he had not at that time any urgent symptom. After a few days, he was attacked with diarrhœa; and it was on account of this affection that I was consulted (along with Mr Hardie), in the second week of his illness. He was, at this time, up and dressed, but looked pale and thin, with a small, frequent pulse: he had slight cough; little appetite, and bad sleep; frequent diarrhœa, and considerable pain in the abdomen. After several days, the diarrhœa subsided considerably, but returned after a few days more, and required constant attention. His pulse continued frequent, and his breathing was rather quick, but his cough was not troublesome: he did not complain of any pain, and he took a full breath without uneasiness. In this manner he passed eight or ten days; the tendency to diarrhœa, and small frequent pulse, being the only prominent symptoms. After this period, his cough became more troublesome, and he complained once of a slight pain in the left side. For this a blister was applied, and the pain was no more heard of. But his strength was sinking; he became pale and exhausted, with lividity of the lips, while the cough was by no means severe, and the breathing was not difficult. The pulse was, as before, small and frequent, and the action of the heart was stronger than natural. He then fell rather suddenly into a state of extreme exhaustion; the skin cold; the look haggard; the pulse extremely feeble; while the loss of muscular strength was not in proportion to the other appearances of

exhaustion: the cough was not severe, and he drew a breath without uneasiness. The diarrhœa by this time had subsided, and, upon the whole, his state was peculiar;—the state of sudden exhaustion being such as there appeared no symptom which fully accounted for it; while, at the same time, he was taking food and wine freely, without any effect in relieving him. He lay in this state two or three days, and then died, about a month from the time when he had measles. Towards the conclusion of his life, it was observed, that pressure on the upper part of the abdomen gave him great uneasiness, especially if it was made towards the left side.

*Dissection.*—The lungs were extensively tubercular, with numerous small vomicæ. On laying open the pericardium, nothing was seen but masses of coagulable lymph. There was no adhesion of the pericardium to the heart, but one continued surface of firm, yellow, adventitious membrane, which lined the pericardium, and was continued over the whole surface of the heart, in general a quarter of an inch thick, and with loose, irregular, flocculent masses of the same substance, lying in the cavity. There was slight ulceration of the mucous membrane of the intestines in several places.

A remarkable circumstance in the history of this dangerous affection is, that it may be going on rapidly, yet insidiously, in the course of another disease, while our attention is occupied by symptoms which have no relation to it.

## CASE IV.

On the 9th of August 1821, I was consulted about a girl, aged twelve, on account of erysipelas of the face. It was not severe, being nearly confined to the right cheek, but was accompanied by a considerable degree of fever, which had rather a typhoid type, but without any appearance of danger, the only remarkable symptom being a great obstinacy of the bowels. The case was of three days standing. For several days more the bowels resisted various remedies, with antimonials, &c., but at last yielded; and, about the twelfth day of the disease, the case had every appearance of terminating favourably. About the sixth or seventh day, I had found her in the morning complaining of pain in the left side, for which bleeding was recommended, but it was not done, on account of the pain subsiding soon after the visit: it was never complained of again, and the breathing was natural. On the 12th, 13th, and 14th days, all the appearances were favourable. The erysipelas had terminated by desquamation,—the fever had subsided,—the tongue was clean,—the appetite returning. On the morning of the 15th day, she appeared low and depressed, in a manner which was not easily accounted for, considering that she had been taking food with appetite for two days, and on that morning taken her breakfast with relish; her pulse was slow, and rather irregular, and the body cold. The coldness in-



creased with rapid sinking, and she died about two o'clock, P. M.

*Dissection.*—The brain, lungs, and abdominal viscera were healthy, except diseased mesenteric glands. The pericardium was distended, with about  $\frac{3}{4}$  of a turbid, milky fluid, with flocculent matter floating in it. The whole inner surface of the pericardium, and the outer surface of the heart, were covered by a uniform coating of coagulable lymph, of considerable thickness. The substance of the heart was soft and flaccid.

To this remarkable case I may add another equally important, which is mentioned by Dr Newman in a late number of Hufeland's Journal. A man, aged twenty-six, who had been affected with cough for some months, was seized with pneumonic symptoms on 5th November 1820. After bleeding, and the other usual remedies, he was much relieved; he was free from pain, and had no uneasiness in breathing; cough continued with free expectoration; and though his pulse continued a little frequent, he was considered as convalescent, and was able to walk about in his chamber. This was his condition on the 12th. During the night he was heard to groan, and in a few minutes was dead.

On *dissection*, the right lung was found hepatised, the left shewed traces of inflammation externally, but was otherwise sound. The pericardium was red and thickened, and contained a considerable quantity of yellowish fluid. Its whole inner sur-

face, and the whole outer surface of the heart, were covered by a thick adventitious membrane, which extended to the origin of the great vessels.

The disease appears under another form in the following remarkable case, in which the cause of death is not very obvious.

#### CASE V.

A man, aged fifty-five, of a florid complexion and full habit, several years before his death consulted me on account of symptoms exactly resembling those of Angina pectoris. He was bled and purged, and restricted to a spare diet; and under this treatment the complaint disappeared entirely. He then enjoyed good health till winter 1819, when he was seized with violent pain in the region of the heart, with much anxiety and oppression of breathing; there was some cough, and the pain was increased by respiration; the pulse frequent, but soft. He was bled and blistered, and in the course of a day the symptoms were removed. He continued for some time weak, but gradually recovered his former health, and returned to his usual employment. About three weeks after the attack, he went to bed one evening in perfect health; about three o'clock in the morning was heard to groan heavily, and in a few minutes was dead.

*Dissection.*—The lungs were sound. The pe-

pericardium adhered to the heart on the right side, for a space about the extent of a crown-piece; the adhesion was soft, and seemed quite recent. The substance of the heart was soft and flaccid, and all the cavities were quite empty. There was a small quantity of bloody fluid in the pericardium, and a little in the cavity of the pleura. The brain was healthy.

When the inflammatory affections of the heart are not speedily fatal, as in the above cases, they are apt to terminate by adhesion of the pericardium to the heart, and the disease, then passing into a chronic state, may go on for months or years, and be gradually fatal by protracted suffering. In some of these cases the symptoms are extremely obscure and undefined; but in general we find violent action of the heart, with more or less uneasiness in breathing, and at last dropsical affections, or death by gradual exhaustion without dropsy. This condition may supervene upon an acute attack, or the adhesion may take place in a slow, insidious manner, without any acute symptoms. The following cases illustrate this state of the disease. In one of them it was complicated with thickening, and adhesion of the valves.

#### CASE VI.

A gentleman, aged sixty-eight, on the 7th June 1820 was seized with a severe fit of dyspnoea, which

was relieved by a draught with ether. He then continued well till the 20th of August, when he had another severe attack, which did not yield to antispasmodics, but was relieved by a bleeding. Within a few days he had two attacks, very severe, in one of which he was again bled. When the paroxysm was over, he did not complain of any pain, and could take a full breath without uneasiness. A few days after the last of these paroxysms, he was seized with hæmoptysis, rather copious; he continued to expectorate blood in considerable quantities for about a week, and for some time longer the expectoration was tinged with it. In the beginning of September, anasarca of the legs began to appear. From this time he had repeated threatenings of dyspnœa, which were, however, checked by antispasmodics; but, about the middle of September, his breathing became permanently difficult, and he could only lie on his back, with his shoulders much raised; the pulse generally about 84, and regular. These symptoms had been partially relieved by purgatives and diuretics; but the relief was only temporary. I saw him, for the first time, about the 10th of October, along with Dr Macauley. I found him sitting up, his legs much swelled, and his face pale and exhausted. He complained of oppression of breathing when he lay down; but while sitting up he seemed to breathe with little difficulty, and could take a full breath without uneasiness; the pulse about 90, and regular; the pulsation of the heart was obscure and undulating. On the 17th, he

was again seized with hæmoptysis to some extent, and died on the 23d, having been confined to bed only two days; and during that time, he complained, for the first time, of pain in his left side. About a month before his death, a strong pulsation was remarked in the vessels of the neck. It occurred in paroxysms, and was observed only a few times, accompanied by lividity of the countenance, and a degree of stupor.

*Dissection.*—There was about ℥i. of bloody fluid in the left cavity of the pleura, and ℥iiss. in the right. The lungs were much gorged with blood, but not diseased in their structure. There was extensive adhesion betwixt the pericardium and the heart, especially at the apex, and along the posterior part. It was most intimate at the apex, where it was very close and uniform; at other parts it consisted chiefly of bands of various extent; the anterior part was pretty free. The left ventricle was considerably enlarged in its cavity. The liver was pale; the other parts healthy.

#### CASE VII.

A man, aged twenty-three, died after an illness of seven months, in which the symptoms were rather obscure. When I saw him a short time before his death, he was much emaciated, but without any cough or expectoration. He had some pain in the left side, and at times a degree of dyspnœa, with

quick breathing, but it was neither constant nor severe; and, when asleep, his breathing was quite natural. His appetite was good, and bowels natural; his pulse generally 100, or above it, but quite regular. The most prominent symptom was a strong pulsation of the heart, which was constant and violent. He died gradually exhausted, without any other symptom.

*Dissection.*—The pericardium adhered intimately to the heart through its whole extent. It adhered also to the neighbouring lung. The right lung was adhering, and slightly hepatised, and much gorged with blood. On cutting into it, a cavity was laid open, the size of a pigeon's egg, full of watery fluid. The left lung was much loaded with frothy mucus. The spleen was enlarged, and tubercular.

#### CASE VIII.

A woman, aged about thirty, had been for several years affected with violent action of the heart, and uneasiness in breathing; and the complaint had originally supervened upon an attack of rheumatism. In 1820 she became dropsical, and the dropsy increased rapidly. When I saw her, a fortnight before her death, her breathing was very much oppressed; the pulse frequent, but regular; there was extensive anascarca; and the enlargement of the abdomen was so great, that it was necessary to relieve her by tapping. The strong pulsation of

the heart had ceased for some time since the abdomen became so much enlarged, but it returned immediately after the tapping. She died in eight or ten days after this.

*Dissection.*—The pericardium adhered to the heart through its whole extent. The opening betwixt the left auricle and ventricle was reduced to a narrow slit, by the valves being much thickened, adhering to one another, and entirely immoveable. The opening betwixt the ventricle and the aorta was also diminished, though in a smaller degree, and the valves also very much thickened, though not as in the other entirely immoveable.

This highly dangerous and insidious affection occurs to us most frequently in connection with rheumatism; but it may also supervene upon any other febrile disease, or it may come on in an idiopathic form, without any previous disorder. In its connection with rheumatism, it may either attack when the rheumatic inflammation has suddenly receded, or it may appear at the termination of the disease, when the rheumatism has yielded in the ordinary way; or it may appear without any change in the rheumatic symptoms, and both complaints go on together. The symptoms vary considerably in different cases. In some there is pain in the region of the heart; in others none. The breathing is generally more or less oppressed, but sometimes in a slight degree; while in other cases the oppression is so sudden and violent, as to prevent articulation,

and threaten instant death. There is, in general, strong pulsation of the heart; in many cases so violent, that it can be felt over every part of the thorax, and even by the hand laid upon the abdomen. In some cases there is vomiting, and in some cough; but cough is not a regular symptom. The pulse is generally frequent, sometimes extremely so; but in other cases it is little affected, and it has even been observed below the natural standard. Respiration is sometimes hurried, but not uniformly so; for in a severe case mentioned by Dr Wells, in which the pulsations of the heart were 190 in the minute, respiration was soft and easy, and not above 24. Attacks of syncope sometimes occur; and in one case which has been communicated to me, syncope was induced by pressure upon the spot corresponding with the apex of the heart. The violent pain produced by pressure on the upper part of the abdomen, mentioned in Cases 2d and 3d, is also a symptom deserving attention. It seems to have been occasioned by the diaphragm being pressed upwards against the inflamed parts. Other modifications of the symptoms occur from the disease being complicated with pneumonia, and sometimes with gastritis. In this acute form it may be speedily fatal; or it may terminate by adhesion of the parts, and be fatal in ten or twelve months. A very small proportion of the cases have terminated favourably. This highly dangerous affection seems not to have been accurately investigated until about the year 1803-4. From that time to the year 1816, about forty cases



of it were published by Sir David Dundas, Drs Wells, Pemberton, Marcet, and others; and such was the formidable character of the disease in their experience, that only one of the cases is reported to have finally recovered;—twenty-five died in periods of from one to ten months; one was alive at the date of the account, but was not likely to recover; four had recovered tolerable health, but were liable to palpitation and dyspnoea upon exposure to cold or any exertion; the remainder were hospital cases, dismissed with the disease going on in the chronic form, after the first urgency of it had subsided. Since 1816, the accounts are rather more favourable, but still the affection is to be considered as one of extreme danger, and the first symptoms of it are to be watched with the utmost care. A remarkable feature in it is, that it is not in general speedily fatal, like other inflammations of vital organs; and the principal danger to be kept in view in the treatment, is such a partial activity as shall relieve the urgent symptoms, while the disease is not subdued. The prognosis, therefore, must be extremely guarded, for even when the most active practice has been employed, and the disease appears to be subdued, the adhesion may have taken place, and the evil be irremediable.

The disease occurs in a more chronic form, in which it steals on slowly and insidiously without exciting much alarm. This form also may supervene upon rheumatism, or may come on without any previous disorder. After a rheumatic attack,

or after slight inflammatory symptoms like a severe cold, the patient begins to feel a pulsation in the region of the heart, more or less violent, at first probably not constant, but excited by any exertion; the attacks being accompanied by some degree of breathlessness, a feeling of suffocation, and sometimes a remarkable throbbing in the head. The affection goes on gradually increasing,—the pulsation becomes permanent,—the attacks of dyspnoea more frequent and severe; till at length dropsical symptoms appear. In some cases the pulsation is not perceived, while the patient is lying perfectly still in the horizontal posture, but is excited by the least exertion, or by rising into the erect posture. On dissection, in both forms of the disease, we generally find the extensive adhesion of the pericardium to the heart, or sometimes, though more rarely, both surfaces covered with coagulate lymph, without adhesion. In the cases which have gone on for a considerable time, the heart is generally enlarged. This enlargement seems to be in many cases confined to the left ventricle, and to consist of an enlargement of the cavity, without thickening of the parietes. In a case by Dr Baillie, it contained ℥ij. of blood. The substance of the heart is generally found pale, soft, and flaccid; and, in some cases, the effects of inflammation have been found in the cavities, as deposition of coagulable lymph within the ventricles, or about the valves, thickening of the valves, and tubercles, or projections of various sizes, on the inner side of the auricle or ventricle. These also appear to have

been observed chiefly or entirely on the left side of the heart. A remarkable example of this disease of the valves occurs in Case 8th. It is a soft, fleshy thickening of them, with adhesion to each other, quite different in its characters from the induration or ossification commonly met with in these parts. In one remarkable case described by Dr Davis, the inflammation seemed to have been entirely seated on the inner surface of the heart, without any disease of the external parts.

The following case affords a remarkable example of the length of time during which the disease may be protracted, and the remarkable changes which may take place in the symptoms during the course of it.

#### CASE IX.

A young man, aged eleven, (in June 1817), had a rheumatic attack, with considerable swelling and redness of his ankles, and smart fever; and the affection was accompanied by strong pulsation or palpitation of the heart. After being confined for several weeks, the rheumatic symptoms subsided, and in August he was taken to the country, where he improved very much in his general health, but the strong action of the heart continued, though it did not appear to produce any inconvenience. On returning to town he became worse, and was confined the whole winter. In summer 1818 he was taken to Bath, where he was weak, and felt much oppressed

by the heat ; but, during all this time, the only marked symptom was the violent action of the heart. He was again confined during the greater part of the winter, the symptoms being aggravated by any exertion ; but, in spring 1819, he began to improve greatly, and in summer seemed to recover perfect health. During the following winter he walked daily to a very distant part of the town to school, took a great deal of exercise, learned dancing, &c. and appeared to enjoy perfect health. During all this period of so remarkable an amendment, however, the same violent action of the heart was felt by laying the hand on his breast ; but he seemed to suffer no uneasiness from it. He continued well during the summer of 1820 ; but in October of that year, he began to have uneasy breathing and some œdema of the ankles. These symptoms were relieved by the usual treatment ; but he continued in very precarious health during the following winter, being liable to a recurrence of these complaints, and not able for any exertion. In the summer of 1821 he again improved remarkably ; and during the following winter, was able to attend the University, and to take a great deal of exercise ; made little or no complaint, but the pulsation was still felt by the hand laid upon the thorax. In April 1822, after riding out in a very cold day, he was seized with rheumatic symptoms, accompanied by increase of the pulsation of the heart, and soon followed by uneasy breathing and anasarca, and from this time the disease seems to have made more rapid progress. I

saw him, for the first time, in June 1822, along with Mr William Wood, whose patient he had been from the commencement of his disease. At this time he looked well in the face, and the pulse was of natural frequency and good strength, with a very slight and occasional irregularity. There was considerable anasarca of the legs, and the action of the heart was pretty regular, but very strong and extended, conveying a tremulous motion to the ribs and sternum, which could be felt over every part of the thorax, and on the left side could be seen when the thorax was exposed. His breathing was somewhat oppressed, especially in the night, when he could not bear the horizontal posture, but required to be much propped up with pillows. The dropsical symptoms were again removed by diuretics, and after some time he went to the country, where he improved remarkably, and was able to take a good deal of exercise, till August, when he was attacked with symptoms resembling cholera. After this attack the anasarca returned; and he came to town in the middle of August, with the swelling in a greater degree than formerly, but without any change in the other symptoms. The anasarca did not now yield to the treatment which had removed it on former occasions, but continued stationary, or rather increased. Little change, however, was remarked in the other symptoms, until the evening of the 28th, when he complained of headach. This continued on the morning of the 29th; and early in the day he was seized with violent convulsion.

The convulsion returned during the day eight or ten times, leaving him comatose in the intervals, and he died in the night.

*Dissection.*—On opening the thorax, the heart appeared of enormous size, seeming to fill more than half the cavity, and pressing the lungs upwards. The pericardium adhered intimately to every part of the surface of the heart; and externally it adhered extensively to the diaphragm and the left lung. The enlargement of the heart was found to be entirely in the left auricle and ventricle, which were prodigiously enlarged and distended with dark grumous blood. The auricle was a great sac, containing at least  $\text{fbi}$ , and the ventricle was enlarged in a still greater degree. Along the posterior part of this immense ventricle, the right ventricle was found lying in a collapsed state, a little elongated, but not diseased. The parietes of the left ventricle appeared rather thinner than natural, and the substance of it was pale, soft, and flabby. The aorta and its valves were healthy. The valves betwixt the left auricle and ventricle were thickened, and contained some nodules of bone. One half of the valve was considerably puckered and contracted; the other was elongated, and of a thick, firm, fleshy consistence. The aperture was quite free. The lungs were dark coloured, and much loaded with fluid. There was some fluid in the cavity of the pleura, and a small quantity in the ventricles of the brain.

In the following case, the disease appears in a

much more rapid form, and with a very important variety in the morbid appearances.

#### CASE X.

A young man, aged sixteen, in March 1821, had acute rheumatism, accompanied by pain in the thorax, and strong action of the heart; but was relieved by two full bleedings, and enjoyed good health till March 1822. He was then attacked again by rheumatism, and a few days after the attack felt some pain in the thorax; but it was so slight that he was not seen by any medical man for eight or ten days. The breathing then became uneasy; and on account of this he was visited by a medical man about twelve days after the commencement of the rheumatism. He had then considerable dyspnœa, violent action of the heart, pain and swelling of some of the joints, accompanied by some œdema of the legs, and scanty urine. Pulse 108. A bleeding was employed, followed by diuretics. I saw him about three days after this, or about the 15th day of the disease. He was then free from rheumatism; his breathing was very difficult, so that he could not lie down without much uneasiness; the pulse was frequent; and the action of the heart very strong and diffused. Though very doubtful of being able to arrest the disease at this advanced period, I recommended making the attempt, by free bleeding, which was accordingly used in the course

of the next three days to a great amount. This treatment was well borne, and there was considerable relief from it; but the relief was only partial and temporary. The violent action of the heart continued, with considerable dyspnoea; and after some time he was affected with anasarca. His breathing became more and more difficult; so that he could not bear the horizontal posture; the pulse frequent and extremely irregular. After continuing several weeks in this state, he improved remarkably; the anasarca disappeared; his breathing became much easier, so that he could lie in any posture; the pulse from 80 to 90, and of good strength, but with some irregularity. The strong action of the heart continued, but without any other urgent symptom. He had continued in this state about a fortnight, when one morning, upon getting out of bed, he dropped on the floor, without any previous complaint, and instantly expired. This was about three months from the commencement of the disease.

*Dissection.*—The heart appeared very much enlarged; and, upon further examination, the enlargement was found to be on the left side, where both the auricle and ventricle were very much enlarged, without thickening of their coats, and both were distended with grumous blood. The auriculo-ventricular valve of the left side seemed imperfect, one part of it being thickened and corrugated, so that it seemed incapable of fully shutting the aperture. The anterior surface of the enlarged ventricle was covered with small, red granulations; but there was



no adhesion of the pericardium to any part of the ventricle. The only adhesion was at the base of the heart, where the enlarged auricle adhered to the pericardium by a space about two inches long, and one inch in breadth. The liver and spleen were both enlarged. There was very little effusion, and no other morbid appearance.

In the following case, the disease seems to have originated in an obscure inflammatory affection, unconnected with rheumatism. It exhibits another very remarkable complication of the morbid appearances.

#### CASE XI.

A man, aged forty-two, about four years before his death, was affected, after exposure to cold and fatigue, with pain in the left side of the thorax, and some uneasiness in breathing. From the account which was received, the symptoms do not appear to have been acute; but soon after he began to complain of palpitation or strong action of the heart, and became liable to attacks of difficulty of breathing, and occasional hæmoptysis. About a year before his death, he was first seen by Dr Davidson. He then complained of cough, difficult breathing, and pain in the thorax. His sleep was disturbed by frequent startings; urine scanty. Pulse about 96, feeble and irregular. The action of the heart was strong, undulating, and irregular,

and very extended, being felt along the sternum, and in the epigastric region. There was œdema of the limbs, and fluctuation in the abdomen. After the use of diuretics, the dropsical symptoms were removed, but returned after two months, when he was again relieved by the same means, and for some time enjoyed better health than he had done for years; the strong and extended action of the heart, however, continued, with dyspnœa upon any exertion beyond the most gentle exercise. In October 1822, the dropsical symptoms returned, with much dyspnœa, and inability to lie in the horizontal posture; and after protracted suffering he died in January 1823. At various times he had been affected with uneasiness in the region of the liver, which was felt to be somewhat enlarged; and, for some time before his death, he had complained of deep-seated pain in the lower part of the abdomen, which was increased by pressure; but he had no pain in passing his urine, and the functions of the bowels were natural.

*Dissection.*—On opening the thorax, the pericardium was found adhering extensively to all the surrounding parts. It adhered also to the whole surface of the heart; and, lying betwixt them, there were found numerous small plates of bone, imbedded in the membrane which formed the adhesion; they varied in size; the greater part of them were of the size and thickness of the nail of a finger, but more irregular in shape. At the parts where they were situated, the adhesion was much stronger than

at the intermediate parts. The heart was not at all enlarged, or in other respects diseased. The liver was enlarged and indurated. The mesentery in several places, chiefly towards the lower part of the intestines, presented a singular appearance. At the part adjoining the intestine, it was so eroded that the intestine was connected with the healthy part of it by the vessels only, the membrane being entirely removed. This appearance extended at one place three or four inches along the course of the intestine, and about an inch and a half from the intestine backwards, along the course of the mesentery. The canal, in other respects, was healthy. There was much effusion in the thorax; that in the abdomen had been drawn off by tapping a few days before death.

On this interesting subject, I shall only add two examples of the disease treated successfully.

## CASE XII.

On 21st January 1817, at seven o'clock in the evening, I saw a man, aged twenty-four, who was affected with acute rheumatism, chiefly seated in his wrists and ankles, especially the latter, which were swelled, extremely tender, and highly inflamed. He complained of an acute pain in the region of the heart, increased by inspiration; his breathing was so oppressed and anxious, that he was unable to lie

down, but was supported by pillows in a half sitting posture. The pulsation of the heart was so violent, that it was felt distinctly over every part of the thorax, and on the upper part of the abdomen. The pulse was 106, and intermitted about twelve times in a minute. The rheumatism had existed about a week; the pulsation of the heart had been felt for two days; the pain and dyspnoea had commenced on the morning of the 21st. A few hours before I saw him, he had been largely bled by Dr Beilby; and we immediately bled him again to between 30 and 40 ounces. After two hours more we found him considerably relieved. Pulse 112, and regular. The ankles still highly inflamed, and extremely tender. He was again bled to 18 or 20 ounces, when he fainted completely, and lay for a long time in a state of extreme collapse; the pulse scarcely to be felt. The inflammation now completely left his ankles; and he could allow them to be moved or pressed in any way without uneasiness; his breathing was quite easy, and the pulsation of the heart had subsided. On the following day he was free from uneasiness, and continued well, except from slight rheumatic pains, without fever, which subsided in a few days.

The following case is still more interesting, from the obscurity of the symptoms, the state of the pulse, and the manner in which the affection came on.

## CASE XIII.

A lady, aged fifty-eight, of a full habit, and previously enjoying good health, was, on 6th September 1821, suddenly seized with severe lumbago. The pain was confined to the usual seat of that affection, and was so severe as to confine her to bed, incapable of motion, but was unaccompanied by fever, or any other symptom. She was visited by Dr Inglis, who advised sudorifics, and the other usual remedies; and the complaint subsided in five or six days. About the 14th, she was able to come down stairs to the drawing-room, and continued well on the 15th, 16th, and 17th.

On Tuesday the 18th, she felt unwell; had some pain darting from the back to the breast, and round the left side, and a feeling of fluttering at the heart. But the symptoms were slight, and during the remainder of that day attracted little attention.

On the morning of the 19th she felt considerable oppression of the præcordia, with a constant and very uneasy pulsation of the heart, as if she were out of breath from quick walking. The pulse was frequent and irregular. She was now again visited by Dr Inglis, who bled her to  $\bar{z}xx$ .

On the 20th, the same symptoms continuing, she was bled again in the morning to  $\bar{z}xx$ . by Dr Inglis, and I saw her along with him about mid-day. She then complained of a feeling of weight and oppression across the region of the heart, and a constant,

uneasy pulsation, which was felt distinctly by the hand laid upon the thorax, and even on the epigastric region. It was not strong, however, but communicated to the hand an irregular, tumultuous feel; and she compared her sensations to that of the heart beating violently after some over-exertion. The breathing, however, was soft and natural, and she took a full inspiration without uneasiness. The pulse was very frequent and weak, and so extremely irregular that it was impossible to count it. She was again bled to nearly  $\frac{3}{4}$ xx., a large blister was applied, and in the evening we found her much relieved; the pulsation had greatly subsided, and her feelings were comfortable; but the pulse continued irregular, though reduced in frequency. The blood was not buffy. She was left for the night, with an antimonial solution to be taken at intervals; but we were sent for at three o'clock in the morning. The pulsation of the heart had returned, with much oppression of the præcordia; the pulse, as before, very frequent, rather weak, and so extremely irregular, that it could not be counted. She was bled to about  $\frac{3}{4}$ xx. When this quantity was taken, she became very sick and faint, vomited repeatedly, and continued for a considerable time sick. As the sickness went off, she felt the pulsation subside, and soon after she fell asleep.

21st.—The pulse was 76, soft, regular, and of good strength. The pulsation of the heart had entirely subsided, and she was free from any uneasiness. Began to take some digitalis.

On the 22d, continued well, and the pulse regular, about 70. On the evening of the 21st had felt some return of the lumbago.

On the morning of the 23d, she continued pretty easy, but there was a slight pulsation to be felt by the hand, and the pulse had become again irregular. On account of these symptoms, she was again bled to  $\frac{3}{4}$ xviij. or xx., which she bore well. From this time, by spare diet and quiet living, she continued to improve, but for some weeks the slightest exertion produced irregularity of the pulse. She had also some œdema of the legs, which was easily removed by diuretics, and by the end of October she was in good health, though liable to palpitation from any exertion. Early in the winter she had another attack, which, however, was slighter than the one now described, and yielded more readily; but, since that time, her pulse has been always irregular, and she is liable to strong action of the heart, upon any exertion or exposure to cold. In other respects she enjoys good health.

I have seen nothing in the least degree resembling the following case, which may be introduced in this place, as it has some analogy to the subject of the preceding observations.

#### CASE XIV.

A boy, aged five years, in the beginning of April 1820, had rheumatism of his knees and ankles, which

were considerably swelled for a day or two. The swelling then subsided, and the pain went off in about a week. He then continued pretty well for a fortnight, during which time he complained of nothing, except that he frequently mentioned a singular numbness of both his thumbs.

On Friday the 29th, late at night, he complained of nausea, and vomited twice; was restless in the night, and frequently sick; the sickness came on in paroxysms, and during them his breathing was rather oppressed.

On Saturday the sickness and vomiting continued occasionally, and he breathed a little quick; but he did not complain of any pain. Pulse 110. Bowels open. Was seen by Dr J. Campbell.

Sunday.—Seemed better; was cool; no vomiting: breathing still rather quick; was sick at times through the day, but at night was better, and took food. At three o'clock in the morning he became very restless, but complained only of excessive sickness; no vomiting; breathing quick.

On Monday I saw him about mid-day. He was pale, cold, and exhausted; breathing quick; pulse frequent and feeble; complained only of sickness, but pressure on the abdomen gave uneasiness; the action of the heart felt irregular and tumultuous; he was quite sensible. Died early in the afternoon.

*Dissection.*—All was sound in the abdomen. In the right cavity of the pleura there was effusion to the extent of six or eight ounces. The lungs were



healthy. On the apex of the heart there was some inflammation, with slight deposition of coagulable lymph. In cutting out the heart, by dividing the great vessels within the pericardium, a sac was laid open which discharged about  $\zeta$ ij. of a transparent, viscid fluid, like the albumen of an egg. The sac was seated on the outside of the heart, was most nearly connected with the left auricle, and extended along the course of the great vessels, lying behind them. It was of an oblong shape; internally presented a smooth whitish membrane, and its coats were very firm. No other disease could be discovered.



The active aneurism of the heart seems to arise either from organic obstruction to the transmission of the blood, or from such an imperfection of the valves, as allows the column of blood to act backwards upon the cavity from which it was issued; the muscular parts in both cases being in a sound and vigorous state. The enlargement which supervenes upon inflammatory action, on the contrary, appears to be owing to an impaired condition of the muscular power produced by the inflammation, the cavity becoming incapable of emptying itself, and being gradually dilated by that impulse which, in the healthy state, would have excited it to contraction. That inflammation does impair the action of muscular parts, we see in other parts of the body; and it is more likely to do so in the heart

than in any other part, from its incessant action, and the strong and uniform impulse which is required at each contraction. The affection is usually accompanied by adhesion of the pericardium; but, in the preceding cases, we have seen that the enlargement may exist without adhesion, and the adhesion without enlargement. Perhaps these varieties may be accounted for by supposing, that the inflammation is in some cases confined to the membranous parts, without affecting the muscular fibre; in others, has its seat in the muscular parts; or that, in such a case as Case 10., the inflammation was so far arrested as to prevent the adhesion, while the treatment was not adopted in time to prevent the deleterious influence of the disease upon the muscular power.

The pathology of the heart as a muscular organ, presents a most interesting subject for investigation. When we recollect how muscular organs in other parts of the body are liable to be deranged in their functions, from a variety of causes; and when we consider the delicacy of the muscular structure of the heart,—its incessant action, and the necessity for the different parts preserving, in the nicest manner, their relation to each other,—we cannot wonder that this action should be occasionally deranged, or that, when it is deranged, alarming symptoms should be the consequence. In this principle we are probably to seek for the explanation of some of those obscure affections of the heart, which have been generally included under the term Angina

Pectoris. This term, in the sense in which it has been commonly used, has been made to include affections which seem to differ considerably from each other; and it is now, I imagine, generally admitted, that they cannot be always traced to any organic affection of the heart. The ossification of the coronary arteries, to which this affection has been referred, is now known to be very often wanting; and, on the other hand, such ossification may be observed in a very extensive degree, without any symptoms of Angina Pectoris. In the history of the symptoms, we observe varieties equally important. We find all the symptoms of angina pectoris continue for a considerable time, and then entirely disappear; and, in other cases, we find them recurring at long and uncertain periods, leaving in the intervals all the functions going on in the most healthy manner. I see no principle upon which these cases can be explained, except a derangement of the muscular action of the heart. The term Spasm has sometimes been applied to them: the phenomena appear rather to favour the conjecture of diminished action, one of the cavities being loaded with blood, which it is unable to expel, and thus interrupting the harmony of the whole. It is probable that such a condition of the parts may occur as an incidental and temporary affection, and that, after continuing to recur for some time, it may be removed, and the parts be restored to their healthy relations. But, it is also probable, that after it has once taken place it may be more and more liable to recur from slight

causes, until it terminate in permanent diminution of the muscular power of some part of the heart, and this be followed by permanent enlargement. The subject is one of much interest, because it is probable that the affection is often of such a nature, that it may be arrested in its progress by minute attention at an early period; but, if allowed to advance to a certain stage of its progress, will terminate in hopeless disease. The causes of such an affection are extremely obscure. Perhaps a slighter degree of the rheumatic inflammation may lay the foundation for it in some cases, so slight as to escape observation when it first takes place. Perhaps over-excitement may derange the muscular power, as we sometimes find patients referring the origin of diseases of the heart to violent exertions in running. But, in many cases, no cause can be traced, and the subject, it must be confessed, is involved in much obscurity.

Without attempting at present any general conclusions on this important subject, the three following cases may be worthy of being recorded, shewing Angina Pectoris, with ossification of the coronary arteries,—the disease without any such appearance,—and extensive ossification of the coronary arteries, without any symptom of angina pectoris.

#### CASE XV.

A gentleman, aged seventy, strong and active for his time of life, a few years before his death had se-

veral apoplectic attacks, from which he had entirely recovered. For the last twelve months, he had repeatedly experienced symptoms like slight attacks of angina pectoris, which affected him while walking, with a pain in the region of the heart, extending along the left arm. It went off entirely upon standing still; had occurred at long intervals, and never excited much attention till 14th February 1822, when he was seized, while dressing in the morning, with a very severe attack of pain, extending from the region of the heart along the left arm, and accompanied by headach, flushing and turgidity of the face, and oppression of the breathing. It soon went off, but returned a short time after, when he attempted to walk out; and again, in the forenoon of the same day, when he attempted to walk up a steep street,—so severely, that he was taken into a shop, and carried home in a sedan-chair. He was now seen by Dr Hay, who bled him from the arm. His pulse at this time was 60. In the evening he was free from complaint, but his pulse was remarkably sluggish, being sometimes so low as 36. He passed a good night.

On the 15th, he was free from complaint the whole day; but soon after going to bed at night, he was seized with severe pain in the left side of the thorax. He was seen by Dr Hay at three o'clock in the morning, when the pain continued unabated, accompanied by headach; the pulse 80, and rather irregular; the breathing much oppressed. Bloodlet-

ting, and all other judicious means, were employed without relief.

16th.—I saw him, along with Dr Hay, at 10 A. M., when the attack continued unabated; the pulse from 80 to 90, and of moderate strength. About mid-day all the symptoms were aggravated; the breathing more oppressed. The pain continued unabated, with great anxiety and restlessness, and a feeling of inexpressible anguish in the thorax. It was aggravated by the horizontal posture, but he could take a full inspiration, without increasing his uneasiness; the pulse had ceased in the left arm, and was very feeble in the right; the extremities cold; but he could get out of bed and return to it without assistance. He lived in this state till six o'clock in the evening, having continued quite sensible to the last, and complaining of the severe pain in his breast till within a few minutes of his death. Farther bloodletting, and all the other usual remedies, had been employed without the least relief.

*Dissection.*—The lungs were quite healthy. There was a small quantity of fluid in both cavities of the pleura. The heart was enlarged, and loaded with blood. The coronary arteries were considerably ossified in various places; and on cutting into the right ventricle, its substance felt in many places gritty, from numerous, small, osseous particles. The semilunar valves of the aorta were thickened, and, both in their substance and at their origin, presented numerous small nodules of bone. The mitral

and tricuspid valves were affected in the same manner, though in a slighter degree. The pulmonary artery and its valves were healthy. The ascending aorta was considerably enlarged, internally covered with scales of ossification, and in some places the inner coat was destroyed. No other disease could be discovered.

#### CASE XVI.

A gentleman, aged fifty, of a full habit, consulted me first in July 1821. At that time he complained of an obscure uneasiness across the epigastric region, occasional palpitation, and a pain in the region of the heart, which attacked him at uncertain periods, especially if walking quick or up-hill. On these occasions it generally obliged him to stop; and if he attempted to persist in walking, vomiting was induced. In the night-time, he was occasionally seized with difficult breathing, accompanied by a pain extending from between the shoulders to the sternum, so violent as to oblige him to get out of bed immediately. His pulse was regular, and his general appearance that of robust health. The complaint was of two years standing. At its commencement, it came on suddenly while walking; and the first attack was accompanied by a sensation "as if a fluid ran from the right side of the chest to the left side, and then stopped suddenly, passing through a space of three or four inches."

Soon after I saw him, he went to the Continent, where he thought himself considerably better. He returned to London in 1822, where he was frequently seized in the night with attacks of violent dyspnœa. He returned to Edinburgh in the beginning of winter. In the night of 23d December, he was seized with one of these attacks of dyspnœa, so severe as to threaten instant death. He was described to me by a surgeon, who saw him in the attack, as affected with the greatest degree of dyspnœa; his face livid; his body cold, and covered with a clammy sweat; his pulse scarcely to be felt. He was unable to speak, was nearly insensible, and appeared moribund. In this state he continued about two hours, and then gradually recovered. He consulted me again on the day following this attack. He was then in his usual health, and described his symptoms precisely as he had done in 1821, with the addition of these severe attacks of dyspnœa, which, however, had only occurred a few times, and at long intervals. He had also been lately seized, while in bed, with pain in the arms, extending across the chest, and accompanied by some dyspnœa, cough, and expectoration. He lay with greatest ease on his back. If he turned to either side, especially the right, he was apt to cough. His pulse was a little frequent, but regular; and his general appearance was still that of robust health. There was nothing unusual to be felt in the action of the heart. His urine was rather scanty. He was now put upon a regulated diet, with attention



to his bowels, some diuretics, and confinement to the house, the weather being very cold. Under this plan he improved remarkably, and in the subsequent visits which I paid to him, he made little or no complaint. His nights were much better; his breathing easy; his pulse quite natural. My last visit to him was on 16th January 1823, when he seemed in excellent health and spirits, and made no complaint, except that he was becoming very impatient of confinement. In the following night he was seized with a fit of dyspnœa, and was dead in a few minutes, before a surgeon, who lived in the floor above, reached his apartment.

*Dissection.*—The lungs were much loaded with blood, but in their structure quite healthy. The right cavities of the heart were natural; the left auricle and ventricle were considerably enlarged, and loaded with blood; their parietes appeared about the natural thickness, except a small part near the apex of the heart, which was remarkably thin. All the valves were quite healthy; and no other morbid appearance could be discovered, except a remarkable enlargement of the opening betwixt the left auricle and ventricle. They had quite the appearance of one continued cavity, with scarcely any division; and it appeared evident, that the valve could have had but a very imperfect action in shutting the opening. There was some bloody fluid in the cavity of the thorax, and a slight appearance of ossification at the commencement of the aorta.

## CASE XVII.

A gentleman, aged sixty, of intemperate habits, was affected, in summer 1821, with anasarca of the limbs, and a yellow tinge of his eyes; and, soon after, swelling with fluctuation took place in the abdomen. His urine was scanty; but the breathing was quite easy, and the pulse natural. The usual remedies were employed for some time, without effect, the swellings having rather increased, and the urine continuing very scanty. At length, about the beginning of August, a favourable change seemed to take place. The urine increased, and the swellings diminished; the other functions continuing quite healthy, except that his appetite, which had been previously good, had been rather impaired for a few days. My last visit to him was on the morning of the 7th of August; he had passed a good night; the urine was abundant, and all the swellings much diminished; the pulse quite natural, and of good strength. He was still in bed; but was preparing for getting up. In less than half an hour after my visit, being still in bed, he became livid in the face, without making any complaint, and instantly expired.

*Dissection.*—There was considerable effusion in the abdomen, and the stomach and the arch of the colon were remarkably distended with flatus. The liver was not enlarged, but indurated, and its whole surface covered with small, hard tubercles, of a black colour; internally, it was of a dark brownish-yellow

colour, and indurated throughout. The lungs were healthy, and there was no effusion in the thorax. The heart was remarkably soft and flaccid, and all its cavities were empty. There was most extensive ossification of the coronary arteries, one of which in particular could be traced for nearly three inches in one continued cylinder of bone, and sending off branches in the same state. Several of the valves were partially ossified. The brain was healthy.—The ossification of the coronary arteries in this case was much more extensive, and much more remarkable, than in Case 15th.

Case 16th, I think, must be considered as a pure example of disease of the muscular action of the heart; and it is particularly remarkable, from the healthy manner in which the functions were performed in the intervals between the attacks, especially for a considerable time before the attack which was fatal. The state of the auriculo-ventricular aperture, is a remarkable feature in the case. I do not know whether it is to be considered as cause or effect. A similar appearance of this aperture occurred in the following case, in which the disease seemed to be brought to a fatal termination by an attack of continued fever.

#### CASE XVIII.

A girl, aged thirteen, had been for a long time liable to sudden attacks of pain in the region of the

heart, and considerable oppression of breathing, which seized her upon making any exertion, such as quick walking or running, or going quickly up a stair, and obliged her instantly to stand still. She was, in other respects, in tolerable health, when, in the beginning of July 1809, she was seized with symptoms of continued fever. For the first week, the symptoms were mild and favourable. About the 8th day, she was observed to have a peculiar quickness of breathing, which occurred only at times, and lasted for a minute or two. After a few days it increased, the breathing during the attacks being quick, with appearance of much oppression and uneasiness in the thorax, and every expiration was accompanied by a noise like a shrill, feeble cry. The attack was accompanied by a violent heaving of the abdomen, and, while it lasted, she was unable to swallow, and often unable to speak. The heart throbbed violently; the face was flushed, inclined to a purple colour, and the pulse extremely frequent. When able to express her feelings, she complained of pain in the epigastrium, extending along the margin of the ribs. These paroxysms were of various duration, from a few minutes to half an hour; they were excited by any exertion, as getting up to stool, coughing, and sometimes by speaking; they occurred generally several times a-day, the longest interval was twenty-four hours, and that occurred only once. During the intervals, the symptoms were those of mild continued fever, without any pain, or any symptom in the thorax. A variety of

practice was employed for ten days, with little benefit: continued free purging seemed to have more effect than any other remedy in suspending the paroxysms, but they always recurred with increasing severity; and, about the 18th day of the disease, the breathing became permanently hurried and oppressed; the pulse 160, but of good strength; the face livid; and every appearance of immediate death. In this state she lay for three days, and died in the morning of the 22d.

*Dissection.*—The bowels were considerably distended with flatus, and were in some places of a livid colour. The lungs were remarkably pale in their colour, and perfectly healthy. The heart appeared flaccid, except the right auricle, which was much enlarged, and its substance so thin from distention as to be transparent. The aperture betwixt it and the ventricle seemed larger than usual, and the valve corrugated and diminished in extent, so as to appear not capable of shutting the aperture. On the left side of the heart, the aperture and valves had quite the natural appearance, and no other disease could be detected in any of the viscera.

#### CASE XIX.

An infant, aged three months, had quick and very laborious breathing, each inspiration being performed with such an effort, that the edges of the ribs were drawn inwards by the violent action of the

diaphragm. The breathing was extremely irregular in frequency, and there were paroxysms of aggravations of all the symptoms, accompanied by a peculiar convulsive sobbing. The pulse was extremely frequent. The affection had been observed in a greater or less degree for about two months. He died in another fortnight.

*Dissection.*—The heart was very large; so that, on first opening the thorax, it seemed almost to fill the cavity. The enlargement was chiefly in the left auricle, which was prodigiously distended, and full of blood. The opening between it and the ventricle was uncommonly large, so that the valve did not appear capable of shutting it. No other disease could be discovered.

In many affections of the heart, an appearance occurs, in regard to which there was formerly considerable diversity of opinion,—I mean the deposition of fibrin in the cavities of the heart, in the form of polypous concretions. It is not now considered as a cause of disease, as it appears to have been in the days of Morgagni; but it is frequently met with in cases in which there had been symptoms of disease in the heart, and I think it is not altogether unworthy of attention. Perhaps it may be considered as an effect of disease,—of some such morbid action of the parts as has been referred to,—in consequence of which the ventricle contracts imperfectly, never entirely emptying itself of blood. In the following case, it occurred in such a remark-

able extent, that it could not be considered as an incidental occurrence.

### CASE XX.

A gentleman, aged sixty, had been liable for six years to palpitation of the heart and dyspnœa. After some time, he became dropsical; was often relieved by diuretics; but the dropsy always returned after various intervals, the intervals becoming shorter. Four years before his death, he was seized with hemiplegia of the right side, and his speech was considerably affected. From these symptoms he never recovered. When I saw him, along with Mr William Brown, a short time before his death, there was a strong and irregular pulsation of the heart; the pulse was weak, irregular, and rather frequent. He was liable to severe attacks of dyspnœa, and occasionally to fits of extreme faintness and coldness. He had general dropsy, palsy of the right side, and inarticulate speech. He died, gradually worn out by protracted suffering, in September 1818.

*Dissection.*—There was extensive effusion, both in the thorax and abdomen. The pericardium adhered to the pleura costalis by a firm, narrow band, less than an inch in length. The heart was much enlarged. Upon opening the right ventricle, the cavity was found much enlarged, and completely filled and distended by a firm, solid mass of fibrin, of a light yellowish colour, without any appearance of blood. On

removing the mass, which was of very great size. a small quantity of blood was found below it. The left ventricle was also enlarged, and was full of grumous blood. No disease could be discovered in the structure of the heart, after the most careful examination, except that the substance of it appeared paler than natural. The enlargement seemed to consist in the dilatation of the cavities, without increase of substance. The aorta was sound. The lungs were much loaded with fluid, and a little indurated. In the anterior part of the left hemisphere of the brain, a portion of the cerebral substance, the size of a large walnut, was of a brownish-yellow colour, and much indurated, except at its lower part, where it was approaching to suppuration.

There are various other affections of the heart, which I think can only be accounted for by the supposition of deranged muscular action, of a slighter and more transient nature. A gentleman who has frequently consulted me, is affected in the following manner. In an instant, and without any warning, he is seized with a most painful feeling in the region of the heart, with severe anxiety and oppression across the thorax, and his pulse becomes feeble and very rapid. There is no dyspnœa; but, on the contrary, he attempts to relieve his uneasiness by frequent and very deep inspirations, which are performed without any difficulty. While the lungs are inflated in the state of full inspiration, a sound is heard by himself, and by a person sitting near him, exactly resembling the loud tick of a watch :



it corresponds in frequency with the frequency of the pulse, and is only heard while the lungs are fully inflated; but it continues to be heard as long as he keeps them inflated, by resting upon the deep inspiration. The attack generally continues from fifteen minutes to half an hour, and then passes off in an instant, with a feeling of some obstruction suddenly giving way. Every uneasy feeling is then instantly removed, and the pulse becomes full, soft, and regular, and of the natural frequency. He is sometimes free from the affection for several weeks. At other times it returns daily, or once in two or three days. In the intervals he enjoys excellent health, and he has been liable to the complaint for twenty years. He is now about sixty or upwards; and the affection does not appear to have had any injurious effect upon his general health.

To these desultory remarks, I shall only add one case of active aneurism of the left ventricle, accompanied by an appearance which is very uncommon.

#### CASE XXI.

A man, aged about forty, received a severe injury of the left side of the thorax, by a fall from a horse. He soon recovered from the immediate effects of it, but was from that time affected by a train of obscure symptoms in the thorax, which, after a considerable time, began to assume the charac-

ters of an affection of the heart. There was obscure deep-seated pain, with occasional attacks of dyspnoea, and a remarkably strong, but regular, pulsation of the whole arterial system, particularly a peculiar and strong jarring of the carotids and subclavians; the pulse generally about 120. The action of the heart was rather stronger and more extended than natural, but by no means corresponding with the remarkable strength of the arterial pulsations, upon which large and repeated bloodletting made almost no impression. His breathing became more and more difficult, with extensive anasarca, and he died about five months after the period of the fall.

*Dissection.*—The left ventricle was nearly twice the capacity of the right, and in its substance much thickened, and very firm; the columnæ carneæ were much enlarged. One of the semilunar valves presented the appearance of a ring, its body being perforated by a irregular opening, which occupied the greater part of it, and gave an appearance as if it had been torn from its attachment along its base, remaining attached only by the two angles. The other valves were healthy. The right ventricle appeared somewhat enlarged; and the right auricle was nearly twice its natural size, and very thin.

The prominent symptom in this case was the peculiarly strong pulsation of the arterial system, especially of the large arteries about the neck. The

pulsation of the heart did not by any means correspond with it, and indeed was much less remarkable than in some of the preceding cases, in which the ventricle was enlarged without thickening. It is also worthy of observation, that a strong and extended pulsation may exist without enlargement. This was most remarkable in Case 11th, in which it was probably produced by the extensive adhesions.

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## II. *Organic Affections.*

Under this head, I intend merely to introduce a few cases, which appear to present some phenomena differing a little from the ordinary cases of organic disease of the heart.

### CASE XXII.

A lady, aged thirty, had been for four or five years affected with pectoral complaints, which for some time had been considered as consumptive. When she came under my care, in the end of 1811, she had a severe suffocating cough, with frequent attacks of dyspnœa. She was liable to frequent and violent palpitation of the heart; and at all times the pulsation of the heart was stronger than natu-

ral. She had frequent pain in the breast, and a painful sense of stricture across the thorax. The attacks of palpitation occasionally terminated in loss of sense and motion, or a state resembling asphyxia, which continued for a few minutes. She had also repeated attacks of loss of vision, in which an object disappeared gradually, as if a cloud had passed over it, and reappeared in a few seconds in the same manner. She had afterwards enlargement of the abdomen, extensive œdema of the lower extremities, with scanty urine, severe and permanent dyspnoea, frequent and violent palpitation of the heart; and, after various remissions and aggravations, died gradually exhausted by accumulated distress in November 1812. The pulse had continued regular until a week before her death.

*Dissection.*—There was some effusion in the abdomen. The stomach was prodigiously distended, so that it appeared to have formed the principal part of the tumefaction of the belly. The lungs were extensively adherent; the left was tolerably healthy in its structure; the right was dark coloured and hepatised. There was very little effusion in the thorax. The left auricle of the heart was very much enlarged, and contained two remarkable bodies. The one was a spherical cyst about an inch and a half in diameter, full of dark coloured, tenacious fluid. The cyst was externally of a dark brown colour, nearly black; and in the fluid which filled it, there were several membranous substances of the same dark colour, like similar cysts in a col-

lapsed state. The other body was a cup or hollow hemisphere, of a diameter exactly corresponding with the spherical cyst, taking in the half of it. It was about one-third of an inch in thickness at the bottom, and became gradually thinner towards the mouth, where it terminated in a thin margin. It was of a light brownish or ash colour, and a firm, fleshy structure, and composed of concentric laminæ, eight or nine of which could be separated from each other at the thickest part of it. It was found lying loose in the cavity of the sinus; but on the outer surface of it, at the bottom, there was an irregular roughness, as if it had been torn off from some attachment to the parietes of the auricle. The spherical cyst did not appear to have had any attachment. The mitral valves were slightly ossified\*.

### CASE XXIII.

A man, aged forty, (12th June 1814), complained of quick and oppressed breathing, and slight pain in the left side of the thorax; but he had little or no cough. His pulse was extremely frequent, and so fluttering and irregular, that it could not be counted. He had been ill about a week, but much worse for the last day or two, so that he could not lie down. After a bleeding, and the other usual

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\* A case very similar to this has been described by Mr William Wood in the Edinburgh Medical Journal, vol. x.

remedies, he was very much relieved; and after three or four days he made no complaint. His breathing was quite easy, his appetite good, urine natural, and he had no cough; but his pulse continued about 160, not to be counted with accuracy, on account of its extreme irregularity. In this state he went to the country on the 20th. I saw him again in the end of July, and found his pulse in the same state, but with scarcely any other symptom. He had walked from the country, a distance of six miles, in a very hot day, and intended to walk back the same distance. His breathing, he said, felt at times a little short, but gave him very little uneasiness. I saw him again in 1815. He then felt unable for much exertion, but made no other complaint; his pulse was in the same state, not under 160. I heard no more of him till April 1816, when I found him moribund, with great dyspnoea, which had been of a few weeks standing.

*Dissection.*—The disease which had given rise to this singular train of symptoms, consisted of two small, round, osseous bodies, like small peas attached to one another, and each attached to one of the portions of the semilunar valve of the aorta, so as to fix the two pieces together near the apex of valve. The third portion was entirely in the natural state; and the attached portions were not otherwise diseased, except that at the attachment of the osseous bodies they were considerably corrugated. The effect seemed to be to diminish the extent of the portions, and consequently to leave an open

space betwixt them and the third portion, in the closed state of the valve. The free opening of the valve was also impeded by the attachment of the two portions. No other disease could be discovered in the heart. There was considerable effusion in the thorax. The other viscera were healthy.

The following case is chiefly remarkable from the pulse having continued so natural, while such extensive disease existed in the heart.

#### CASE XXIV.

A young lady, aged eighteen. I was first consulted about her in September 1822, on account of anasarca of the legs. No other symptom was complained of; but, on examination, I discovered a remarkably strong and extended pulsation of the heart, of which I could obtain no history, except that she had been for several years liable to palpitation, but had experienced no inconvenience from it. The pulse was quite natural. The anasarca soon disappeared under the usual treatment, and she went to the country in her usual health. Some weeks after she had cough, with pain of the breast, and was bled from the arm with relief. She then made no complaint; but the strong and extended action of the heart continued. In the beginning of winter, she had again cough, and considerable expectoration, which had a puriform character. The pulse slight-

ly accelerated, but quite regular. The strong action of the heart continued; and it appeared on close examination that it was not synchronous with the pulse, but seemed to alternate with it. She seemed to suffer little or no inconvenience from it. Through the winter she continued with little change, and no very urgent symptom. The cough varied; sometimes troublesome, and sometimes less so; the pulse regular, and very little above the natural standard. In the end of February she was out several times, but, in the beginning of March, the anasarca returned, with some hæmoptysis, dyspnoea, lividity of the countenance; and she died about the 20th, the action of the heart having continued as before, and the pulse nearly natural up to the day of her death.

*Dissection.*—On opening the thorax, the pericardium appeared to extend over a much greater space than usual: it adhered closely to the left lung, and the right adhered closely to the mediastinum, so as to form one continued uniform surface. On the outer surface of the pericardium, there was some deposition of coagulable lymph. Internally it contained a good deal of fluid, and was free from any adhesion to the heart. The heart was much enlarged, and presented a singular appearance, being distinguished into two separate portions, one of them of a deep purple colour, the other of the usual colour. The former was the right auricle, so enormously enlarged as nearly to equal all the other parts of the heart; it was thin, and completely distended with



dark grumous blood. The right ventricle was also much enlarged; the auriculo-ventricular aperture was large, and the valve corrugated. The left auricle was enlarged, and distended with grumous blood, and the auriculo-ventricular aperture was reduced to a narrow opening, by the thickening of the valve, and the adhesion of the parts of it to each other. The left ventricle was quite of the natural appearance, and the valves of the aorta quite healthy. The lungs were considerably hepatised; the left was much compressed by the enlarged heart.

Organic disease may exist in the heart without producing any urgent symptoms. But it appears that, even in these cases, it may be suddenly fatal.

#### CASE XXV.

A man, aged sixty, who had previously enjoyed perfect health, except occasionally slight dysuria, awoke early in the morning of 30th September 1812, complaining of violent pain in the upper part of the abdomen. It afterwards extended to the lower part of the belly, and was attended by suppression of urine. He had also great oppression of his breathing, and some vomiting. At nine in the morning he was found in a state of insensibility, and without pulse, and died about twelve.

*Dissection.*—The urinary bladder seemed a little thickened in its coats. No other disease could be

detected in the abdomen. In the brain, there was a very small quantity of bloody fluid in the ventricles. The valves of the heart were all more or less ossified, and at the opening betwixt the left auricle and ventricle, there was a large irregular mass of ossification, which extended about half way round the opening. The substance of the left ventricle was remarkably soft, as if from the effect of putrefaction, the finger being pushed through it with very little resistance, while no such appearance was presented by the right side of the heart, which was firm and healthy.

The state of the right ventricle in the following case was singular. It was probably an original formation.

#### CASE XXVI.

A man, aged thirty-five, had been for a year before his death affected with dyspnœa, and palpitation of the heart. He had afterwards extensive anasarca, and died very suddenly in June 1814.

*Dissection.*—There was considerable effusion in the thorax. The ascending aorta was hard, and covered with scales of ossification. The valves of the heart were slightly hardened. In the right ventricle there was a singular adhesion of its sides, about an inch and a half from the bottom, cutting off a cavity, into which a small finger could be pushed with difficulty, on each side of the adhesion.

The lungs were loaded with frothy mucus, but were not diseased in their structure.

### CASE XXVII.

Perforation of the Septum of the Ventricles.—  
An infant, born in September 1821, shewed nothing unusual till four or five weeks after birth, when it was remarked, that when he either cried, or was exposed to cold, his hands and feet became of a livid colour. At first it went off entirely, but afterwards, during the winter, his toes and fingers were always more or less lived, and when he was exposed to the air, the lividity extended to his arms and legs, and appeared a little in the face. Nothing farther occurred till he was seven months and a half old, when he was suddenly seized with laborious breathing, accompanied by long and deep sighs ; the pulse rapid and irregular; the action of the heart strong, but felt only at intervals ; the body cold. The attack went off gradually, and afterwards recurred at intervals of about four weeks, but became slighter. He died in the sixth attack, in October '1822. It was slighter than any of the preceding, and only resembled syncope. In the intervals between these attacks, he enjoyed good health, and appeared as thriving as the most healthy child of his age ; and during the summer the livid or blue colour of his extremities had nearly disappeared, except at the time of the attacks.

*Dissection.*—At the upper part of the septum of the heart, there was a round opening, more than half an inch in diameter, with smooth and rounded edges, making a free communication betwixt the ventricles.

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### III. *Rupture.*

I have met with two cases of rupture within the pericardium, and the symptoms were considerably different. The first might have been mistaken for apoplexy.

#### CASE XXVIII.

A man, aged about thirty-five, had complained for some time of headach, but had not been confined from his usual labour, which was that of a joiner. One evening he had returned from his work, and was sitting by the fire, when, in stooping forward to lift something, he fell forward on the floor and expired.

*Dissection.*—All was sound in the brain. The pericardium was found distended with coagulated blood; but owing to an error of the person who conducted the dissection, it was neglected to ascertain the spot where the rupture had taken place, until after the heart had been cut out and laid open, and then it could not be ascertained with accuracy.

## CASE XXIX.

A woman, aged twenty-eight, of a plethoric habit, had for some time complained occasionally of pain in the left side, with difficult breathing; but the affection was slight and transient. On Tuesday, 15th July 1817, she walked to Musselburgh, and returned considerably fatigued. On Wednesday she kept in bed, and complained of pain extending from the left side of the thorax to the left shoulder, but it did not seem to be severe; and through the greater part of the day she was sitting up in bed, nursing a child whom she was suckling. Without any other symptom, she died very suddenly at five o'clock P. M., not having been seen by any medical man.

*Dissection.*—The pericardium was found distended with coagulated blood, which appeared to have been discharged from a small ragged aperture at the root of the aorta. It was of such a size as admitted a common quill. The aorta at this place was thin, and the whole of the ascending aorta was considerably, but uniformly dilated. The heart adhered extensively to the pericardium at the posterior part. There was some bloody fluid in the left cavity of the thorax, and the right lung adhered extensively. The other organs were healthy.

For the following remarkable case I am indebted to Mr George White, who intended to present it to the Society, but has kindly allowed me to introduce it here.

### CASE XXX.

A man, aged seventy-seven, strong and muscular for his years, and able for the work of a labourer, while so employed on the morning of 19th March 1823, was suddenly seized with a pain of the chest, extending from the spine to the sternum. It was accompanied by an immediate and remarkable failure of strength; so that he got home with great difficulty, with the assistance of a fellow-labourer, and frequently stopping to rest by leaning his back against a wall, the distance being about a quarter of a mile. He then complained of great anxiety and oppression, but without dyspnœa; his pulse extremely small and feeble, but regular and not frequent. Nothing unusual was remarked in the action of the heart. He lived ten days in this state, with very little change in the symptoms. There was a constant dull uneasiness, occupying the region of the heart, and extending to the back; extreme anxiety and restlessness, leading him to seek relief from a constant change of posture; the pulse as before very feeble, but regular and without frequency. When in bed he generally lay on his

back, but was seldom observed to sleep, and often got up and sat by the fire, as if expecting some relief from the change. On the evening of the 28th his anxiety and restlessness increased; and in attempting to get out of bed, he suddenly expired. For three days before his death he had passed a considerable quantity of blood by stool. Twenty years before his death he received a severe injury by falling with a load upon his back; after which he was apt to start in his sleep, and never could lie on his left side, though otherwise in good health.

*Dissection.*—The cavities of the pleura contained about ℥iij. of fluid. The lungs were sound. The pericardium appeared greatly distended, and when opened was found to contain an immense quantity of coagulated blood. The heart was much enlarged, and very flabby; and it was covered externally by a layer of coagulable lymph, which was easily peeled off, and seemed to be of recent formation. The aperture from which the hæmorrhage had taken place was in the left ventricle, about half way betwixt the base and the apex, and close by the side of the septum. Externally, it was of such a size as would have admitted a catheter of the largest size, but internally this communicated with an ulcerated cavity the breadth of a shilling, by which the substance of the ventricle seemed to have been gradually eroded. This cavity communicated not only with the external opening, but also with the right ventricle, by a perforation of the septum. The left

ventricle was much enlarged, and its parietes were much thinner than natural. One of the semilunar valves of the aorta was partly ossified. The abdominal viscera were healthy.

Mr White is disposed to think, that, in this remarkable case, the rupture took place at the period of the first attack; and the small opening being stopped by a coagulum, the heart was enabled to continue its feeble action during the remainder of his life. I am rather inclined to think, that the first attack was connected with the erosion of the septum of the ventricles, and that the external opening immediately preceded his death.

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#### IV. *Displacement of the Heart.*

This subject perhaps does not properly belong to the pathology of the heart, but the following cases seem worthy of being recorded. The first exhibits a very singular condition of the lungs, from which there is every reason to believe that, as the right lung was gradually destroyed by ulceration, the left became enlarged, so as to perform the function of both. The second case is chiefly remarkable from the rapidity with which the disease took place, and the obscurity of the symptoms.



## CASE XXXI.

A gentleman who, at the time of his death, was twenty-one years of age, at the age of ten had suffered severely from measles, which left him affected with cough ; and the complaint was much aggravated by an attack of pneumonia in the following year. From that time he was never free from cough, with expectoration, which was distinctly purulent, and often in large quantity ; and he had repeated attacks of hæmoptysis. He was stunted in his growth, and of a feeble habit, but, in other respects, enjoyed tolerable health, and was able to attend to the business of his profession, till the beginning of July 1822, when he became affected with a disease of the brain, of which he died in three weeks. About three years before his death, it was first observed accidentally, that the pulsation of his heart was entirely in the right side ; but of the history of this peculiarity nothing farther could be learned from any of his friends.

*Dissection.*—On opening the thorax, the left lung first presented itself so enlarged as to occupy at least three-fourths of the cavity. It was quite healthy, except a small tubercular mass at the upper part, in a solid state. To the right of this lung was found the heart, so situated as to be in contact with the ribs of the right side. Behind the heart, and nearly concealed by it, lay the remains of the right lung,—a dark and fleshy mass, like the substance of the spleen. It was about four or

five inches long, about three inches broad, and an inch and a half in thickness. Internally, it contained a series of small abscesses, communicating freely with each other, and with the trachæa. There were four abscesses in the substance of the brain.

### CASE XXXII.

A girl, aged twelve, had been liable to pectoral complaints upon exposure to cold, but for some time had enjoyed excellent health, when, on the 28th of April 1823, she complained of pain of the left side, with cough and difficult breathing; the pulse 120. After bleeding and the other usual remedies, she was relieved, and, for the five or six following days, she made little or no complaint; but the pulse continued from 100 to 120. On the 3d of May, a strong action of the heart was first remarked: it was not accompanied by any urgent symptom till the 6th, when the cough returned, with difficult breathing; and these symptoms continued on the 7th and 8th, without being relieved by any of the remedies that were employed. On the 9th, the breathing became extremely difficult, but was considerably relieved by topical bleeding. I saw her, for the first time, at 4 P. M. The breathing was then considerably oppressed. Pulse 120; her look pale and anxious. The action of the heart was strong and tumultuous, and was felt almost entirely in the right side. In the natural situation no pulsation was

felt. It began to be felt about the sternum, and was strongest about two inches to the right of the sternum. From this it was felt very strong all along the right side, and in the epigastric region. She died the same evening.

*Dissection.*—The left cavity of the pleura was filled by an immense quantity of thin and very fœtid puriform fluid, amounting to several pounds. The left lung was compressed into a flat solid mass, in many places little more than half an inch in thickness, in others about an inch. It was covered by a firm layer of coagulable lymph, and was internally not diseased, except from the remarkable compression. The whole pleura costalis of the left side, the upper surface of the diaphragm, and the left side of the pericardium, were also covered by a thick and firm adventitious membrane. The heart was pressed towards the right side, or rather into the centre of the thorax behind the sternum. It was quite healthy. The outer surface of the right lung shewed marks of inflammation, with some deposition of adventitious membrane; and in the right cavity of the pleura there was a considerable quantity of a turbid, puriform fluid.

## REMARKS

ON THE

## CRANIUM OF A MAN WHO DIED OF SYPHILIS,

EXHIBITED TO THE MEDICO-CHIRURGICAL SOCIETY  
OF EDINBURGH.By GEORGE BALLINGALL, M. D. F. R. S. E. Regius  
Professor of Military Surgery, &c. &c.*(Read 2d January 1822.)*

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**I**N the month of May last, I was requested by a gentleman in town to visit the individual to whom this skull belonged, and found him lying on a couch, extremely reduced and emaciated; the face and upper part of the scalp covered with numerous blotches and incrustations, one of which was particularly prominent, and projected like a horn over the centre of the frontal bone. Various superficial ulcerations and blotches were also conspicuous on his body and limbs, but these he did not seem inclined to shew me to their full extent, as he appeared to have lost all hopes of cure, and considered me, I believe, as only visiting him from motives of

curiosity. The same idea rendered him very little communicative as to the history of his complaints, and he seemed quite unable to give any distinct or connected account of their progress. All I could learn from him was, that the disease had commenced by an ulceration on the penis, which destroyed part of the glans; that he had also been affected with buboes in the groins, and subsequently with ulceration of the throat, cutaneous eruptions, and exfoliation of spiculæ of bone from the nostrils; that he had laboured under the disease for three or four years, had been under the care of various practitioners, and had used much mercury, besides other remedies.

He was now, I found, using the decoction of sarsaparilla under the direction of Dr Kenney, which I desired him to continue; and, after consulting with Dr K., we agreed to prescribe the Plummer's pills, of which he was directed to take three daily, along with the decoction. Under this course, a rapid amendment took place; the incrustations dropped off from his skin; he recovered his looks and flesh, and, in short, complained of nothing but an offensive discharge from the nostrils; his spirits got up, and he seemed to entertain sanguine hopes of recovery. In this state, he came over from the Old Town to my house late one evening in the month of July, during the prevalence of a cold easterly wind: he complained of having caught cold, was exceedingly hoarse, and, upon inspection, the palate and fauces were found considerably inflamed. On in-

quiry, I ascertained that of late he had been repeatedly out at night, and had been living altogether in a very irregular and dissipated manner. I ordered him home instantly, desired him to confine himself entirely to the house, to lay aside the use of the Plummer's pills, to take a dose of salts, and to go into the warm bath; which directions, with the exception of the confinement, I have reason to believe he complied with.

Soon after this, an ulcer broke out in the palate, immediately behind the incisores,—the velum palati and tonsils also became ulcerated,—the offensive discharge from the nostrils increased,—pieces of the inferior spongy bone exfoliated,—the teeth dropped from their sockets,—and, although mercury in every form had for some time been laid aside, a copious salivation now commenced, owing to the irritation from the diseased state of his mouth affecting the salivary ducts and glands. He was unable to take almost any thing in the shape either of food or medicine. Of the latter, nothing was recommended to him but bark, laudanum, laxatives, and an alum gargle. He continued to linger for several weeks, and expired about the beginning of November, greatly emaciated, and exhausted by hectic fever.

On examining the exterior surface of the cranium, a circular portion of the right parietal bone, about the size of a shilling, may be observed flattened and somewhat rough; from this an exfoliation had taken place previous to the patient's

coming under my care. On the interior surface of the bone, opposite to this spot, the impressions of numerous small vessels are to be seen deeply indented into the bone, and giving it a rough scabrous feel.

On the central aspect of the frontal bone, two circular portions are to be seen marked by the impressions of numerous small vessels similar to what is observed on the parietal bone.

Large portions of the superior maxillary bones, including the alveolar processes of the front teeth, are in the progress of exfoliation.

On examining the base of the skull, the condyloid and cuneiform processes of the occipital bone, and the posterior clinoid processes of the sphenoidal bone, may be observed partially diseased.

This is a case of which different views will be taken, according to the ideas entertained by different practitioners, respecting the utility or injurious effects of mercury. This individual may either be considered as poisoned by that mineral, or sacrificed to the want of it; and unfortunately the detail of circumstances is so meagre and imperfect, that, by a little ingenuity, the case may be made to support either side of the question. There is no doubt, however, that the disease to which this person fell a victim had a venereal origin; and, from my never having observed a similar affection of the bones in any of those numerous cases in which I have exhibited mercury to a large extent, for the cure of he-

patitis, I am naturally inclined to consider the morbid appearances which this skull presents as the result of the syphilitic poison. In support of this opinion, I beg leave to contrast the preceding case with the three following, in the first of which a similar affection of the bones of the nose and upper jaw was cured by mercury, or at least got well under the use of that mineral.

1. In the year 1812, while serving in the East Indies, Charles Forster, a soldier of the Royals, came under my care affected with venereal blotches and ulcerations on various parts of his body: he had considerable swelling of the nose and face, with an offensive discharge from the nostrils; and after the exfoliation of a portion of the vomer and inferior spongy bone, a discharge of about sixty or eighty maggots took place from the antrum. This patient was at the same time affected with phthisical symptoms, and, notwithstanding these, I was induced to persevere in the use of mercury, under which he recovered.

2. In the course of last year, I saw a young lady several times, who was kept for *seven months* under the influence of mercury, for the cure of an obstinate liver disease, and eventually recovered, without any affection of the throat, skin, or bones.

3. For the last *two years*, I have occasionally visited a lady labouring under extensive visceral



disease, whose system has been for nearly the whole of the above period under the influence of mercury, and who, nevertheless, has not had the smallest symptom of mercurial disease,—no ulceration of the throat,—no eruption on the skin,—no thickening of the periosteum,—nor caries of the bones.

It were easy for me to refer to numerous cases similar to the above, but at present this appears to be totally unnecessary ; for while rotten bones have long been considered the legal inheritance of those who have suffered much from venereal disease, I am not aware that a *single instance* has yet been brought forward of mercury producing a similar affection of the bones, when exhibited for the cure of any other disease than syphilis ; and until well marked and unequivocal cases of this kind shall be produced, those who advocate the utility and safety of mercury are not bound to obviate an objection to its use, which has not been proved to exist.

SOME OBSERVATIONS

ON

A PECULIAR AFFECTION,

TO WHICH THE BONES OF THE CRANIUM  
ARE LIABLE.

By JAMES RUSSELL, F. R. S. E. Professor of Clinical  
Surgery in the University of Edinburgh, and Vice-  
President of the Society.

*(Read 16th January 1822.)*

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ALL the bones of the body are liable to be attacked with various diseases, whose effects are modified by the local situation of the bone, and by the nature of the parts with which it is connected. The bones of the cranium, like other bones of the body, suffer from attacks of caries, erosion, exfoliation, &c. But, besides the morbid affections incident to other bones, the bones of the cranium are likewise liable to an affection peculiar to themselves, in so far, that a portion of one of the flat bones, not apparently affected with any kind of disease, is sometimes completely separated from the contiguous bones, by the process of absorption, which removes a portion of substance the whole thickness of the bone, and thereby destroys

all connexion with the surrounding bone, of which it originally formed a part. A similar process is, no doubt, the method commonly employed by nature, to separate the dead and diseased parts of the body from the living and the sound. But, in those cases, the death or disease of a part acts as a stimulant to the absorbent vessels in the neighbourhood, to exert an unusual degree of activity, for the removal of the dead or diseased part. While, in the cases to which I refer, there is no obvious cause of excitement to preternatural activity in the absorbents from the presence of any kind of preternatural irritation.

I first witnessed an instance of the separation of a portion of a sound parietal bone, in the case of a young man, who had a small tumour removed from the scalp by excision. The base of the tumour adhered to the pericranium, which had to be removed along with it; and by its removal, left a small portion of the cranium bare. But this very limited denudation of the cranium would not, under ordinary circumstances, have produced any perceptible effect; or at most, only the exfoliation of a superficial lamella of bone not thicker, nor more extensive, than a herring scale. But the separated portion to which I refer, was the whole thickness of the cranium, and equal in dimensions to a crown-piece. In all its circumstances, it possessed the character of a healthy bone, retaining the colour, thickness, weight, and every other appearance of health. No circumstance appeared in the history of this case, to account for the commencement of the separation of this por-

tion of healthy bone, at so great a distance from the place where the irritation was applied. There was no useful purpose to be accomplished by the removal of this large portion of healthy bone; so that the cause from which this process originated is involved in complete obscurity.

The next instance in which I had an opportunity to observe the commencement of a similar process, was in the case of a young lad, who had his skull fractured by a fall. He died in about twelve days after the accident, when the erosion was found to have begun at a considerable distance from the place where the injury had been received. The nature of the violence which a fall produces will not account for the establishment of the process of absorption, at so great a distance from the place of the original violence, since there is nothing in the nature of the violence itself, to affect the texture of the bone, and to excite irritation, at the remote place where the absorption began.

In the case of the fracture of the skull from external violence, the fragments of bone, although completely detached by the primary effects of the blow, do not always separate immediately from the mass of bone to which they belong, but are, in some cases, retained in their places, and for some time kept alive, by adhering to the pericranium and dura mater. These membranes, however, afford too scanty a supply of nourishment to preserve the fragments in life for any considerable time. But as the approach of death is gradual, the fragment has time

to undergo a change of state, before it becomes completely dead. It changes colour, loses part of its substance, and acquires a smooth white surface, so that, by the time of its final separation, it exhibits the appearance of a piece of polished ivory. The portion of bone which is surrounded by a circle of absorption, would appear to undergo similar changes, when the process of absorption is slow, and the surrounded bone gradually deprived of its nourishment. In the second case to which I refer, this change was going on at the time of the patient's death.

There is another modification of the affection, arising from the extension of the absorbing process, over the whole internal surface of the portion which is to separate. In this case, nothing but the external lamella of the bone remains at the time, when the circumferential absorption is completed; so that the separating portion very much resembles the appearance of a common exfoliation. The two cases, however, differ essentially from each other. In the one case an entire and solid portion of the original bone is left to cover and protect the brain, while nothing but a superficial lamella separates. In the other case, on the contrary, this exterior lamella is all that remains of the original bone, so that after its removal, the brain is left without any solid covering of bone, to protect it from injury. Both cases are, in common language, included under the generic name of exfoliation. Though the distinction is obvious, and the detachment of the whole thickness of the cranium exhibiting the appearance of a com-

mon exfoliation, occurs, I believe, more frequently, than is in general imagined. There is one difference which may naturally be expected, viz. that the remnant of the entire bone may be depressed, by the pressure of a probe, to a greater depth, in consequence of not meeting with any resistance, till it comes into contact with the surface of the brain; while, in the other case, the exfoliated lamella cannot be depressed so far, as it very soon reaches the entire subjacent bone, which prevents any farther depression. The resistance, in this case, is not only presented sooner, but also more suddenly, from the solidity of the obstacle which the remaining internal table of the skull opposes to the farther depression of the external table; whereas, in the former case, the resistance is not only more remote, in consequence of the removal of the internal table, but likewise more gradual, from the soft and yielding nature of the brain, which admits of some degree of compression, before the resistance becomes insurmountable. Attention to this circumstance, considering the delicate texture of the brain, and the facility with which it may be injured, should induce a surgeon to be cautious in his attempts to ascertain the depth to which the superficial lamella may be sunk, by the pressure of a probe, lest a rash attempt may injure the tender substance of the brain.

There is another affection of the bones of the cranium, of very rare occurrence indeed, which may possibly originate from the same cause, though, up-

on this point, I cannot speak with confidence. In a few cases, an aperture, about the size of a shilling, has been found in the bones of the cranium, without any other appearance of disease, or without giving occasion to any bad symptom. I have witnessed an instance of this affection in the course of my own experience; and there is another instance, recorded in a collection of cases, published by Mr Wilmer of Coventry. Both of these cases first attracted notice, by the appearance of a soft, prominent, fluctuating tumour, which seemed to contain a fluid. The tumours were opened, after considerable hesitation, on account of the suspicious nature of the case. A small quantity of red coloured fluid was discharged. The whole surface of the cavity, formed by the destruction of bone, was sound and free from any vestige of disease; and the cure went on progressively, without the smallest interruption or inconvenience to the patients. The whole history and progress of those cases is exceedingly singular, since, from any thing that is known with regard to the laws of the animal economy, one should not have expected, that so great a destruction of parts could have taken place, without having been accompanied with some other appearance of disease, or of having been productive of some serious symptomatic affection.

When a portion of the cranium separates from the dura matter, by the slow process of absorption, the corresponding surface of the dura mater has time to become covered with a crop of granulations, which

protect it from the effect of the exposure which takes place upon the removal of the detached portion of the cranium. The protection which the presence of this adventitious covering of the dura mater affords, is sufficient to exempt the patient from the risk of those severe attacks of symptomatic fever, which so frequently follow the sudden exposure of the dura matter to the access of air, or other causes of irritation. Upon this account, it is imprudent to remove the detached portion of the cranium prematurely, lest the surface of the dura mater should not be sufficiently protected by a crop of granulations. A delay, regulated by prudence, is not attended with inconvenience, since the process employed by nature, to separate the portion of the cranium, neither excites local irritation, nor constitutional disturbance, nor favours the formation of purulent matter in any great quantity, in those mild cases of the affection to which I now refer. There is not, therefore, any motive to be precipitate in removing the detached portion of the cranium. Impatience on the part of the patient, or of his relations, often indeed tempts them to interfere injudiciously, and to accuse the surgeon of temporising more than is consistent with the urgent nature of the case, which sometimes induces a surgeon to be more active than he would otherwise have been, had he been left to follow solely the dictates of his own deliberate, unbiassed judgment.

The manner in which the aperture in the bones of the skull is filled up, by the formation of new matter, has been an object of much interesting in-



vestigation. The authors who have written upon the subject, have represented the regeneration of bone to be very incomplete, never amounting to more than the emanation of some osseous spiculæ across the aperture, without ever forming a solid mass of bone. In other cases, the aperture has been found to be filled up by the projection of fungous growths, from the surfaces of the scalp and dura mater, which met in the middle of the aperture, and served the purpose of a plug; but without adhering to the edges of the bone; while, in other cases, the aperture formed by the head of a trephine has been found unaltered many years after the operation had been performed. Such, therefore, appears to be the general fact, with regard to the occlusion of apertures in the bones of the cranium. But, notwithstanding the generality of the fact, it is not universal, since I have, in the course of my own practice, known instances, in which such apertures have been filled up with solid bone, under very different circumstances.

In one case, the case of a patient who had been trepanned several years before his death, the perforation of the trephine was found to be filled up with solid bone.

Another very curious case of regeneration presented itself in the case of a young man, who received a severe injury on the head, by falling from a great height. Besides other effects of the violence, the sagittal suture was separated about one-fourth of an inch through its whole length. The patient died about two years after the accident;

when, upon inspecting the body, the sides of the sagittal suture were found to be still separated to their original distance, but the vacuity was completely filled up with regularly organized solid osseous matter.

In a third case, in which a portion of bone, larger in dimensions than a crown-piece, was extracted through the scalp by excision, the deficiency was gradually supplied by a solid mass, which came at last to be elevated above the surface of the cranium. This new growth possessed all the firmness of solid bone. I watched the progress of the case carefully, for many years; and from the most attentive examination at different periods, I was satisfied that a complete regeneration of osseous matter had taken place. The removal of a portion of the cranium does not necessarily disturb the functions of the brain. Portions, even of prodigious extent, have been removed, without producing any inconvenience to the patient. Saviard mentions the case of a young woman who had lost the whole of the parietal bones, together with a part of the frontal and occipital bones, forming a portion as large as the skull-cap which is removed in preparing to dissect the brain. Yet, notwithstanding so great a loss of bone, this young woman enjoyed perfect health.

In the earlier stages of the affection its existence is unknown, since the mere process of absorption, unaccompanied with any marked disease, neither excites pain, nor any other kind of disturbance in the constitution, and frequently appears to be a sa-

lutary, rather than a morbid action. In most cases, therefore, there is no circumstance which attracts notice, till the whole circumferential perforation is completed, and a portion of bone detached, when, like a foreign body, it acts upon the superjacent parts, and excites irritation in the scalp. The case is now presented, under circumstances similar to those of common exfoliation, and requires to be treated upon like principles.

## AN ACCOUNT

OF THE

APPEARANCES OBSERVED IN THE DISSECTION OF TWO OF  
THREE INDIVIDUALS PRESUMED TO HAVE PERISHED  
IN THE STORM OF THE 3<sup>D</sup>, AND WHOSE BODIES WERE  
DISCOVERED IN THE VICINITY OF LEITH ON THE MORN-  
ING OF THE 4<sup>TH</sup>, NOVEMBER 1821 ;

WITH

SOME REFLECTIONS

ON THE

PATHOLOGY OF THE BRAIN.

By GEORGE KELLIE, M. D. &amp;c.

PART I.

*(Read 6th February 1822.)*

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ON Sunday morning, the 4th November 1821, three dead bodies were discovered in the immediate vicinity of Leith :—the body of one man was found a little to the east of the Links, not far from Seafield Baths,—that of another near to Hermitage Place, also in the links,—and the body of an elderly female was discovered in the neighbourhood of Crown Street. The preceding night had been remarkably

tempestuous, cold, and dark ; and as the discovery of three dead bodies extended on the ground, was an occurrence as singular as it was shocking, there seemed, from the first, little reason to doubt that these unfortunate individuals had fallen victims to the severity of the weather.

One of the bodies was immediately recognised as that of a well known pauper of the parish, and removed by his friends. The other two bodies were exposed in the portal of the church ; and remaining still unclaimed on Monday, Mr Cheyne and I were requested by the Magistrates to inspect these, and report to them our opinion respecting the cause of death.

The one body was that of a middle-aged man, perhaps about forty years ; the other that of an elderly female.

The countenance of the man was alike free from turgescence and collapse ; the complexion was pallid, and somewhat sallow ; his features were calm, and without distortion. No mark of external injury or violence could be discovered on any part of his body ; even the neck, shoulders, back, and hips, were quite free from that redness, livor or ecchymosis, so commonly observed in the bodies of the dead. There was no discharge of blood or other fluid from his mouth or nostrils. The body, generally, might be described as presenting the appearance of more than usual freshness and soundness. The abdomen was flat, and not at all tympanised. The trunk and limbs had the usual rigidity of death. On di-

viding the scalp, it was remarked by Mr Cheyne, that very little blood flowed from the integuments of the head. On exposing the dura mater, its surface, where torn from the cranium, was observed to be studded with numerous bleeding points; the whole membrane was somewhat congested, suffused, and heightened in colour; and its sinuses were loaded with dark blood. The veins of the pia mater were very turgid, and extensively injected, so that the whole membrane had a more than usual vascular appearance, and somewhat heightened colour. Following the convolutions of the brain, there was a milky or œdematous appearance, arising from effusion of serum, between the arachnoid coat and pia mater. The cerebrum itself, in texture and colour, seemed perfectly sound. The choroid plexus presented no appearance of turgescence. In the ventricles of the brain, and at the basis cranii, were found between three and four ounces of serous fluid; perhaps rather more than one half of this quantity at the basis cranii, the remainder within the ventricles.

On opening the abdomen, our attention was arrested by the very deep colouring of the small intestines. The ileum in particular, through its whole extent, was very red, and presented a very beautiful example of vascular congestion. A fine net-work of injected vessels spread under the peritoneal coat, over the whole extent and periphery of the ileum and jejunum. The stomach and colon had nothing of this congestion or colouring; and

the contrast between the appearances of these and of the small intestines was very striking. The stomach indeed was remarkably contracted and pale, nearly empty, or containing only about two ounces of a grey-coloured pultaceous fluid, having a faint animal odour. Its peritoneal and muscular coats were natural. On its internal or mucous membrane were observed a few spots, of a coffee-ground colour, and ecchymosed appearance. The liver was congested with blood, but had, in all other respects, the natural and healthy appearance. The spleen was rather empty and flaccid. There was no deviation from the usual appearances in the other abdominal viscera.

The woman appeared to have passed her sixtieth year. Her complexion was more sanguine than that of the man. The corpse was equally free from blemish or injury. Here, too, Mr Cheyne remarked that very little blood flowed from the integuments of the head, when divided. The dura mater was not so highly coloured as in the man; its veins, however, were injected, and its sinuses were loaded with blood. The pia mater, and the veins between the convolutions of the brain, were fully injected, and very turgid. About three ounces of serous fluid were found in the ventricles of the brain, and at the basis cranii.

In the abdomen, the omentum was found large, and very much loaded with fat: the colon was also buried in fat. On raising the omentum, it was a very striking coincidence to observe, that here also

the small intestines exhibited precisely the same appearance as in the man; the same redness, not in patches, but over the whole extent of the bowel; and occasioned by the same general and minute injection of the vessels, profusely ramified beneath the peritoneal coat. The stomach and colon, too, were in this case of the usual pale colour, having no vestige of the same vascular congestion. The bowels were not tympanised. The stomach was not so contracted and empty as in the man: it contained about four or five ounces of viscous fluid, and a few pieces of indigested beef. There were on the mucous membrane of the stomach a few congested spots, of a florid purple colour. The pancreas was of an unusually dark flesh colour. The liver, spleen, and other viscera presented no uncommon appearance.

In our report, therefore, to the Magistrates, we considered ourselves justified in stating our conviction, that these unfortunate victims had not fallen in consequence of any violence or injury inflicted by themselves or others; and our belief that they had perished from the severity of the weather, to which they had, in some way or other, been exposed during the whole of a very tempestuous, cold, and dark night. That storm began early on Saturday evening. During the whole night it blew a furious gale, at first from the N.E., then from E.S.E., and again from the N.E., accompanied by violent drifts of rain, of sleet, and of snow. The night





was besides very dark ; and from the violence of the wind, and the drifts of sleet, the air felt much colder than the temperature actually indicated by the thermometer, which, in this neighbourhood at least, never perhaps fell lower than, if indeed so low, as the freezing point. One thermometer, I have been informed, was observed at midnight to indicate  $30^{\circ}$  ; but a register-thermometer, kept by an accurate observer in our immediate neighbourhood, at **Hermitage Hill**, had not sunk lower than  $34^{\circ}$ .

The neighbouring hills, and those on the opposite side of the Firth, were next morning seen whitened with snow ; but no snow remained on our own roads or lower grounds, nor was there observed any appearance of actual congelation. This was not, therefore, a temperature capable of producing frost-bite, nor such as might not have been resisted by vigour of constitution, and persevering exercise. But the furious gale which blew, and the sleet and snow which fell, would greatly increase the benumbing influence of even this degree of cold, and impede the exertions of those who were exposed to it. If the struggle were once given up,—if those individuals, benighted, fatigued, faint, and worn out,—from the darkness of the night despairing of recovering their way,—lay down, and continued exposed for hours to such chilling blasts, we cannot wonder that they slept to wake no more. Nor does there appear any other probable cause which can be assigned for the simultaneous death of three individuals, but the one common to all,—the influence

of the cold and tempestuous wet weather, to which they had been for many hours exposed. I know besides, from the case of a boy whom I attended some years ago, and of which an account was published in the 1st volume of the Edinburgh Medical and Surgical Journal, that a degree of cold short of congelation may produce great torpidity, after long exposure, in a state of inactivity, to its influence.

I have not been able to collect any very accurate history of our three victims. The pauper, who perished at Hermitage Place in the Links, was seen by a gentleman, who gave him weekly alms, between nine and ten o'clock on Saturday night, then in his usual health; and it is presumed that about this time he had walked towards the neighbourhood, where his dead body was found next morning, to call on another benefactor. The woman, we are informed, left her house sober about the same hour, to procure water from a pool near to where she was found dead: so that, with regard to these individuals, we are pretty sure that they had been exposed to the influence of the storm from an early hour on Saturday night. The man who was found to the east of the Links, we have learned was on his way to Musselburgh; but of the rest of his history I know nothing. My own opinion is, that all three had lost their way, and from the extreme darkness of the night, and the violence of the wind and rain, had been unable to recover it, until they dropt or lay down from fatigue or despair. As it was Saturday night, when the labouring classes

usually receive their wages, and too often indulge to excess in spirituous liquors, it might indeed be that these individuals had been in some degree intoxicated when exposed to the sedative power of the weather. But there is no positive proof of this; while, on the contrary, the few particulars which we have learned bear rather against the supposition. Again, the contents of the man's stomach did not exceed two ounces, and were free from any spirituous or vinous odour; those of the woman's stomach Mr Cheyne did think had the smell of ale or beer, but this was not recognised by my own sense. It may still be alleged, that the want of this test is yet no argument against the presumption of previous intoxication. But, in the absence of other proof of the fact of intoxication, we must give some weight to this negative observation; as the state of torpor and insensibility would seem to be one rather incompatible with an activity of digestion and assimilation, such as could have altogether decomposed and changed any intoxicating fluid previously existing in the stomach; and, indeed, the pieces of unchanged meat found in the stomach of the old woman, are proof that the digestive process had been suspended.

In reviewing the appearances observed in the dissection of these two bodies, our attention cannot fail to be arrested by the striking resemblance which the one, in almost every particular, bears to the other. In both we observed the same soundness

and freshness of the bodies,—in the abdomen the same congestions of the same viscera, and especially the same remarkable redness of the small intestines, from turgescence of their bloodvessels,—the same absence of fœtor, putrescency, and tympanites,—the same perfection of the other viscera, with the exception of the pancreas of the woman;—in the head, the same bloodless state of the scalp,—the same turgidity of the vessels on the surface of the brain,—the same congestion of the sinuses,—the same soundness of the cerebral texture,—and the same serous effusion, amounting in the one to nearly four ounces, in the other to about three.

These cases appear to me the more interesting, that there are probably few histories of the dissections of those who have died of torpor from cold on record. My search at least after such cases has not been very successful. But the single case which I have met with agrees in what I am disposed to consider the most important point, with the cases of which an account has just been given. The case is related by Quelmalz, in the 6th volume of Haller's "Disputationes." On dissection, the vessels of the brain were observed turgid with blood, and in the ventricles was found an effusion of serous lymph\*.

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\* "Confirmat id evidenter ipsa anatome senis septuagesimum ætatis annum transgressi, quam ann. 1726, demonstrationibus publicis tunc præfixus instituti. Cujus in itinere, mense Januarii, constituti, prope Zwenckaviam, frigore vehementi extincti oppressique, cadaver theatrum anato-

The effect of low temperature on the nervous system, in producing a torpid and lethargic state in certain circumstances of exposure to a cold atmosphere, is familiarly known by many recorded instances; and the progressive symptoms of this short but fatal disease, if so we may call it, appear to be weariness and faintness, debility, languor, lassitude, torpor, irresistible drowsiness, lethargy, profound coma, and death.

This state, then, seems, in its symptoms and progress, to bear a striking resemblance to other diseases of the order Comata. This affinity was remarked by Galen, and has been admitted by succeeding writers. Sauvages notes both a Carus and Lethargus à frigore, and gives examples of each; and Dr Cullen, after enumerating all the more acknowledged cases of apoplexy, admits this

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“micum delatum, blandoque calore, ob rigiditatem ejus fo-  
 “tum, præter alia in cunctis vasis sanguifluis, tam arterio-  
 “sis, quam venosis paullo capacioribus polyposas concretiones  
 “longas, teretes, figuram de reliquo vasorum suorum post ex-  
 “tractionem æmulantes, simulque vasa meningum sanguine  
 “turgida lymphamque viscidam in ventriculis observanda præ-  
 “bebat. Illorum igitur plerosque, quotquot gelu excessivo  
 “intereunt, ex apoplexia, perrupto vel sanguine, vel sero ac-  
 “cumulato in cerebri ventriculis succumbere, vero videtur  
 “simillimum. Ipse sopor vel somnus, in quem adeo proclives  
 “sunt, ante mortem, serumque largius in cerebri ventriculis  
 “post mortem repertum, non obscurum ejus rei præbet testi-  
 “monium.”—Quelmalz, Progr. quo frigoris acrioris in corpore  
 humano effectus expedit, Lipsiæ 1755. Halleri Disp. Medic.  
 tom. vi. Lausannæ 1758.

one; remarking, however, that cold is one of those causes which produce apoplexy, not by compression, but by destroying the mobility of the nervous power. The signs, however, of what is considered compression, were found to exist within the heads of our cases, and of that related by Quelmalz. Congestion, indeed, and the effusion of from three to four ounces of fluid within the head, are appearances commonly considered as indications of compression, and as affording no unsatisfactory explanation of the phenomena of a previous disease, the symptoms of which had been those of disorder or suppression of the functions of the brain. If, on the dissection of a patient, who had died of a disease characterised by all the ordinary symptoms of any of the comata, the physician were to discover such appearances as were found in these cases, he would be satisfied, congratulate himself perhaps on the accuracy of his diagnosis, and admire the correspondence between the symptoms of functional derangement, and the lesions discovered in the organs of those functions. In various head cases, I have certainly seen a less satisfactory concordance between the symptoms and the organic changes discovered on dissection; and many such examples might easily be produced from the recorded experience of other physicians. I am quite aware of the objection, that these indications of what is called compression, discovered in the brain of those who have died from cold, are rather to be regarded as contingent effects than the cause of the apoplexy which terminated in death; or, in

other words, that the observed congestion and effusion are the effects of the retarded return of the blood from the head, the consequence of a general immobility of the nervous power induced by the sedative action of cold. The objection has been thus stated by the illustrious Cullen: “ With respect, “ however, to the circumstances which may appear “ upon the dissection of persons dead of apoplexy, “ there may be some fallacy in judging, from those “ circumstances, of the cause of the disease. What- “ ever takes off or diminishes the mobility of the “ nervous power, may very much retard the motion “ of the blood in the vessels of the brain, and that “ perhaps to the degree of increasing exhalation, or “ even of occasioning rupture and effusion ; so that, “ in such cases, the marks of compression may ap- “ pear upon dissection, though the disease had truly “ depended on causes destroying the mobility of the “ nervous power.”

In admitting the force of this objection, I must remark, that the explanation cannot be limited to those cases arising from the action of narcotics and cold on the nervous system, but may, with great truth, be extended to many of Dr Cullen’s cases of apoplexy from compression. In many, for example, where one or more attacks of simple apoplexy have been recovered from, and one at last proves fatal,— where a gouty, paralytic, or epileptic individual is suddenly taken off by a paroxysm of apoplexy,— where headaches, vertigo, sickness and lethargy, have slowly led on to fatal carus or apoplexy,

—or when death has been ushered in by hydrocephalic fever,—we may, on dissection, discover congestions and effusions of blood or of serum, which we justly regard as connected, in the order of cause, with the last fatal attack, or with the symptoms of the more advanced disease; but to which we should, I apprehend, err in attributing all the symptoms which marked the approach, or constituted the earlier stages of such cases. I am disposed, indeed, to consider the appearances of congestion of the brain observed in dissections, as always somewhat questionable and equivocal. It is certain, I think, that the appearances exhibited by the vascular system after death, give no very true or accurate representation of the balance of circulation as carried on during life. During life, the blood is shared, in some proportion or other, between the arterial and venous systems; and however much the balance may at different times vary between these systems, still the circulating fluid is constantly passing from the one to the other, and must, at every instant of time, be divided between them in such a way, that neither can ever be perfectly depleted or congested at the expence of the other. Not so when life has ceased; for then the arterial is found to be comparatively deprived of, and the venous system to be congested with blood. This is strikingly true in particular parts, and in none more remarkably than in the brain. In no part of the body, with the exception perhaps of the cavæ and sinus venosus, do we find on dissec-



tion so much of venous congestion as in the brain; the sinuses of the dura mater are almost always loaded, and the veins at the basis and on the surface of the brain are commonly distended with blood. In some cases this congestion is certainly more remarkable than in others; and often we are enabled to connect this greater than usual congestion, with symptoms which during life had seemed to predicate such a state. But here, too, we find but little blood in the arteries, and the less perhaps the more the veins appear congested. It may, therefore, be concluded, that the blood which after death we find congested within one set of vessels in the brain, is just that quantity of blood which was circulated within the head, and at every instant of time distributed, in some proportion or other, between the arteries and veins during life.

With regard to effusions, there seems less obscurity. Where three or four ounces of fluid are found extravasated, we can hardly doubt that this had been effused during life,—was the effect of some modification of the circulation, and the cause of some of the phenomena of that disease which terminated in death. The effusion which was discovered within the heads of our subjects, can hardly be regarded as a post-mortem production; nor can it be presumed that it existed previous to their exposure on that night which terminated their existence. The perfect parallelism of the two cases,—their agreement with another case by Quelmalz,—their simultaneous exposure and death on the same

night that another individual died under similar circumstances, render such a supposition highly improbable. If this serous effusion were not a post-mortem effect, and if it had no existence previous to the exposure of the individuals, then we must conclude that the whole, or the greater part, was effused in the short interval between their exposure and their death.

What this interval was we have not the means of determining with perfect precision ; but we know that the maximum cannot exceed ten hours, and the probability is, that the interval was considerably less than this. Be it then from six to eight hours, and in this short interval from three to four ounces of fluid are effused within the membranes of the brain. When, however, the cavity of the cranium is actually encroached upon by the depression of its own walls, or by an effusion of fluid within its cavity, one of two things it is obvious must follow,—either the compression of its previous contents into less space, or the displacement and removal of an equivalent bulk of those contents. Adopting the latter alternative, some physicians have inferred, that the brain itself, in the case of serous effusion, has been, to a corresponding extent, wasted or absorbed ; and Dr Cheyne, who favours this opinion, has, in his work on Hydrocephalus, considered effusion in the light of a salutary and counteracting event, by which that requisite equality of pressure, which would otherwise have been lost by the wasting or absorption of the brain, is continued and maintain-

ed \*. I am not prepared to deny this doctrine in all cases; I believe, on the contrary, that in some instances such a diminution of the mass of the brain by absorption may take place. But in our cases it seems highly improbable that, in the course of a few short hours, from three to four ounces of brain could be wasted or removed by absorption; and the supposition is in some other instances, as in that of the sudden effusion of blood upon, or within, the brain, and of the fracture, or depression of the cranium, absolutely impossible.

It seems more probable that, in most cases of intrusion on the brain, compensation may be made at the expence of the circulating fluid within the head; or, that less blood is then admitted and circulated within the cranium than before such encroachment on its capacity had been effected. The argument has been already taken up and illustrated by Dr Abercrombie, who, in his ingenious analysis of apoplexy, has, from a consideration of the peculiarities of the circulation within the head,—of the physical necessity of the constant plenitude of the cranium, and of the incompressibility of its contents, endeavoured to shew the improbability of any intrusion being made on the brain without a corresponding displacement of some portion of its circulating blood †. I agree in most of the reasonings and conclusions of

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\* Cheyne's Essay on Hydrocephalus.

† Observations on Apoplexy, Edinburgh Medical and Surgical Journal, vol. 14.

this intelligent pathologist and observant physician. I admit, that when the arteries are enlarged by plethora, the veins are not only prevented from a corresponding enlargement, but must, probably to the same extent, be narrowed and compressed, and that a certain derangement of the circulation will necessarily follow. My conception, however, of this derangement of the circulation is somewhat different from his: and if we differ only in terms, it may still be of some consequence to contrast these, as I cannot help thinking the language in which Dr Abercrombie has stated his opinions has led to still greater misconception of what was probably intended by him, of what, at least, I conceive to be the true state of the question. I cannot conceive an interrupted circulation of blood within the brain while life is continued; nor can I admit that the derangement being once established, more blood can continue to be admitted by the arteries, than is transmitted by the veins. If the tonicity of the arteries by any means become impaired, and their capacity be enlarged, if they receive an overcharge of blood, and do not transmit this directly to the veins, the arteries will become permanently plethoric; but the veins must, at the same time, discharge from the head a quantity of blood, equivalent to the permanent increase of blood in the arteries: Or, if the total quantity of circulating fluid within the head be  $Z$ , and the quantities contained respectively in the arteries and veins be  $X$  and  $Y$ , then  $X + Y = Z$ . If now, the circulation become de-

ranged in the way supposed, and if the surcharge  $a$  become permanently congested in the arteries, the accumulation within those vessels will now be  $X + a$ , and the contents of the veins  $Y - a$ ; for on any other supposition than  $X + a + Y - a = Z$ , the total quantity of blood within the head would be increased, or diminished, which is at least contrary to the hypothesis.

Whilst, then, such derangement of the circulation is producing within the head, to whatever extent the one set of vessels is becoming overcharged, to the same extent, it seems probable, is the other set becoming voided. But this derangement must have its limits, for were it repeated at every systole of the heart, one set of vessels would at length become entirely voided and compressed; the circulation would then indeed be interrupted, and instant death rather than apoplexy be the consequence. While life continues, the effect of this derangement, whether in the case of *arterial* or *venous* congestion will, in truth, be a retarded rather than an interrupted circulation of blood through the brain; for, in the one case, the diminished quantity of blood which is transmitted from the head by the narrowed veins will be the exact measure of that which, at each systole of the heart, can be forced into the plethoric and congested arteries; and, in the other, the quantity which the compressed or contracted arteries can admit, will measure the quantity carried from the head by the enlarged and congested veins; or the derangement once established, more blood

cannot continue to be admitted by the one than is discharged by the other.

The circulation within the head is, in truth, of a very peculiar description. The brain itself, little compressible, is contained within a firm and unyielding case of bone, which it exactly fills, and by which it is defended from the weight and pressure of the atmosphere,—a force constantly acting on every other part of the system,—a force, therefore, which must be constantly operating to maintain the plenitude of the vascular system within the head.

If these premises be true, it does not then appear very conceivable how any portion of the circulating fluid can ever be withdrawn from within the cranium, without its place being simultaneously occupied by some equivalent; or how any thing new or exuberant can be intruded, without an equivalent displacement.

One of my oldest physiological recollections, indeed, is of this doctrine having been inculcated by my illustrious preceptor in anatomy, the second Monro,—a doctrine which he used to illustrate by exhibiting a hollow glass ball, filled with water, and desiring his pupils to remark that not a drop of fluid escaped, when inverted with its aperture downwards. His opinions, however, on this subject stand recorded in his work on the Brain and Nervous System. . “For,” he observes, “as the substance of “the brain, like that of the other solids of our “body, is *nearly incompressible*, the quantity of “blood within the head must be the same, or

“ very nearly the same, at all times, whether in  
 “ health or disease, in life, or after death, those  
 “ cases only excepted in which water or other mat-  
 “ ter is effused, or secreted, from the blood-vessels;  
 “ for in these, a quantity of blood, equal in bulk to  
 “ the effused matter, will be pressed out of the cra-  
 “ nium \*.” It can scarcely, I think, be supposed  
 that this doctrine should have been thus broadly  
 maintained by so practised an anatomist, so acute  
 an observer, and so excellent a pathologist, on spe-  
 culative grounds only. The fair presumption, on  
 the contrary, seems to be, that, in the course of his  
 very extensive experience, he had observed nothing  
 in the appearances of the vascular system of the  
 brain, under the varied circumstances of health and  
 disease, which seemed to militate against the hypo-  
 thesis. It is, at least, by such an appeal to nature  
 that the merits of the hypothesis are to be tried.

*1st*, Is it then true and consistent with experience,  
 that we cannot lessen, to any considerable extent,  
 the quantity of the blood within the cranium, by  
 arteriotomy or venesection? In diseases of the  
 head, in those, especially, presumed to arise from  
 plethora and congestion of the vascular system of  
 the brain, and distinguished by such symptoms as  
 have been conjectured to indicate compression of  
 that viscus, we bleed generally and topically, with  
 the intention of obviating or removing this local

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\* Monro on the Brain, &c.

plethora; the brain, in fact, recovers its energies as we thus lessen the quantity of the circulating mass; and it seems natural to infer, that the vessels within the head have been proportionally unloaded.

By bloodletting we may, indeed we must lessen the force of that general pressure, which through the medium of the circulation, is constantly exerted on the brain;—a pressure, however, which (like that applied to water, or other inelastic and incompressible fluids) I can conceive to be increased or diminished to a great extent, without compressing it; and yet, to modify and influence the functions of this wonderful viscus. Nay, as Monro has well remarked, “the less compressible we suppose the substance of the brain to be, the more readily we understand how the whole of it may be affected by a plethora, or increased momentum of the blood.”

By abstracting, then, from the general mass, we perceive, at least, the possibility of relieving the brain from inordinate pressure, and of restoring the disturbed balance of its circulation, without having actually lessened the quantity of fluid circulating within its own vessels. It would seem, indeed, that a certain range of pressure is necessary for the due performance of the cerebral functions, as comatose and convulsive symptoms are induced by depletion and diminished pressure, as well as by plethora and inordinate pressure\*.

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\* “Σπασμὸς γίνεται ἢ ὑπὸ πλεθωσιλῶ, ἢ κενωσιλῶ.”—Hippocratis Aphorism. s. vi.



I believe it will be found nearly true, that there are such obstacles as the hypothesis supposes to the free depletion of the vascular system within the head.

In our dissections, we do not meet with very striking varieties in the appearances of those vessels : the sinuses of the dura mater, and the veins in general are found filled, or congested. Even the brains of those who have been largely depleted during life, or who have sunk from inanition, do not appear much voided of their blood \*. The brains of our apoplectic patients themselves, whom we have, in the course of one or two days, of a few hours perhaps before death, bled to a great extent, with the very purpose of unloading their vessels, are still found

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\* “ There may be determination of blood to the head, and  
 “ great turgescence of vessels, even when the patient appeared  
 “ to have died of hæmorrhage.”—an important observation, to  
 which Mr Cooke, in his abridgment of Morgagni, adds the fol-  
 lowing : “After uterine hæmorrhage, and also after copious de-  
 “ pletion, on account of pulmonary and other inflammations, I  
 “ have frequently observed the symptoms of cerebral conges-  
 “ tion, and which has generally appeared to arise from the ex-  
 “ citement occasioned by some mental effort, though occasion-  
 “ ally it has arisen without an evident cause ; whilst the other  
 “ parts of the body appear comparatively bloodless, the vessels  
 “ of the head throb violently ; there is severe pain ; confusion  
 “ of intellect, sometimes to such a degree as to threaten deli-  
 “ rium.”—*Cooke's Morgagni*. I have myself seen many such  
 instances. I may add here another observation which I have  
 frequently made,—that fits resembling Apoplexy and Epilepsy,  
 as well as fits of {Syncope, occasionally supervene to ordinary  
 venesection at the arm.—G. K.

congested with blood. In animals bled to death, the brain still retains much of its blood; the vessels on its surface are red, well filled, and sometimes exhibit the appearance even of turgidity and congestion. I had hoped, without any new cruelty, to have been able to determine the extent of this fact by a reference to the brains of the sheep and oxen which are daily slaughtered, by bleeding, in our markets. But, it was objected, that, by the division of the intercostals and eighth pairs of nerves in the way in which these animals are killed by the butcher, their death might be accelerated, and time not allowed for a more full and perfect depletion of the sanguiferous system.

While meditating this subject, I learned indeed, that some experiments of this kind had been already made with another view, by Dr Sanders and Dr Seeds, of which an account had been published by the latter in his Inaugural Dissertation, “*De Sanguine Misso*,” printed at Edinburgh in 1815. These experiments consisted in bleeding dogs to death, with the view of determining the comparative effects of arteriotomy and of venesection; and the results, in so far as they affect the subject of our present enquiry, appear to be, that the brain could never be entirely depleted of its red blood;—that the sinuses and veins of the brains of animals bled to death from veins, are commonly more turgid, than they are found to be in those which have died from arterial hæmorrhage;—and

that in both, there was found more or less of serous effusion within the head\*.

So far, then, these experiments seem to confirm the proposition, that no part of the circulating fluid can be withdrawn from within the cranium, without its place being simultaneously occupied by some equivalent.

Having obtained permission from a butcher, I opened the carotid artery of one of his sheep, and the jugular vein of another, in presence of Dr Duncan junior, Dr Anderson, and Dr Combe. The moment the artery was opened, the blood was projected with great force to a distance of several feet; soon after, it flowed more slowly, and per saltum only, and the jet gradually became smaller and smaller. We observed (as Dr Parry had done) the gradual contraction of the calibre of the artery as the vascular system became emptied, and we saw that it has itself no pulsatory motion, or alternate dilatation and contraction.

Ten minutes after the carotid had been opened, the breathing was hurried and laborious, and the animal was slightly convulsed. The blood for ten minutes trickled more slowly down the neck; the eye became heavy and listless, and the breathing more and more oppressed; and at twenty minutes from the commencement of the experiment, there

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\* Si sanguis plurimus sive ex arteria, sive e vena efflueret, aqua intra caput effunditur.—Seeds, *Dissert. Inaug. de Sanguine Misso*, &c. 1815.

was a general convulsion, and the animal instantly expired.

When the vein was opened, the blood gushed out in a copious stream, but soon began to issue more slowly. In twelve minutes, the sheep was convulsed; and in twenty-one minutes from the time of opening the vein, he died. These sheep were immediately fleeced, and cut up in the usual way by the butcher; and the heads were separated, labelled, and set aside for examination on the following morning.

A, The sheep bled from the carotid artery.—The dura mater contained but little blood; the sinuses were full; the pia mater was well injected; and the vessels following the convolutions of the brain were seen full, tortuous and anastomosing freely; the choroid plexus was well filled with florid blood.

B, The sheep bled from the jugular vein.—The integuments of the head of this sheep were observed to yield more blood when divided than the head of the former. The dura mater was rather paler; the larger vessels of the pia mater were well filled, but the minute injection and colouring of the membrane was less remarkable than in the sheep bled from the carotid. The sinuses at the basis cranii were loaded with dark coloured blood. The choroid plexus was not so well injected, and not so florid as in the first animal.

C, We examined the heads of two sheep, which had been slaughtered for the market by the butcher

in the usual way. Blood was found in all the sinuses; several florid red vessels were seen ramifying over the brain and membranes; but these brains were decidedly paler, and we all agreed that they contained less red blood than the brains of the two sheep whom we had bled. They had a more watery and serous aspect as it were, but there was no palpable effusion of serum on their surface, or within their ventricles.

Some days after, having obtained three other sheep, one of them was slaughtered in our presence after the usual manner by the butcher, that we might ascertain the quantity of blood lost by the animal, and note the time, and manner of its death.

D, Sheep slaughtered in our presence by the butcher.—The blood rushed out in torrents. In one minute after the infliction of the wound, the animal became convulsed, and in two minutes died. The quantity of blood lost was exactly thirty-four fluid ounces.

The heart was found to contain about two drachms of blood. There was nothing remarkable in the other thoracic or abdominal viscera. The sinuses at the basis of the brain were full of blood. The veins on the surface of the brain, cerebellum, and medulla oblongata, were also filled. A fine web of vessels over the corpora striata, was beautifully injected with florid blood. A very little serum was found in the ventricles.

E, In this sheep, I first tied both carotids; and

four minutes after, I opened the jugular veins. The blood flowed at first very freely, but afterwards more slowly, unless when the animal was convulsed, when the hæmorrhage was constantly observed to increase. In two minutes after the veins had been opened, the breathing became very laboured, and even convulsive. In seven minutes the sheep was powerfully convulsed, and again, and repeatedly afterwards for ten minutes more, the last convulsion observed being at eighteen minutes from the time of opening the jugulars. The blood now flowed slowly and by occasional drops only, and at twenty-three minutes after the veins had been wounded, the animal died. The quantity of blood lost was thirty-eight fluid ounces.

The ventricles of the heart were nearly empty, or contained no appreciable quantity of blood. The sinuses of the head were in their usual state; those at the basis of the brain contained less blood than we have hitherto found in them, and the veins on the hemispheres of the brain were less filled; the choroid plexus was pale and empty; the vessels on the basis of the cerebrum were better filled, those ramifying on the basis cerebelli were minutely injected. There was a slight but very decided serous effusion within the ventricles.

F, In this I commenced by passing ligatures on both the jugular veins, and thus obstructing the return of blood from the head; and in five minutes thereafter I opened the right carotid. The bleeding was profuse and rapid. In two minutes after-

wards, there was strong convulsion, and uneasy respiration; and in nineteen minutes from the commencement of the hæmorrhage, this sheep died; the quantity of blood lost being thirty-seven and a half fluid ounces. The heart was nearly voided. The sinuses of the dura mater were found loaded with blood. The veins of the pia mater were also well filled. Numerous vessels on the basis of the brain, on the medulla oblongata, the tuber annulare, and the quadrigemina, were beautifully injected with florid blood. The choroid plexus was remarkably turgid, and there was a fine web of vessels well filled on the corpora striata. No serous effusion.

G, A dog weighing twenty pounds, and bled to death from the femoral arteries. In a few minutes he was convulsed; he survived the experiment fifteen minutes, having lost just fifteen fluid ounces of blood. There was somewhat more than one ounce of blood in each ventricle of the heart. The arteries were every where empty. The cavities contained blood and air. The mesentery and intestines were pale and bloodless. Not a drop of blood could be expunged from the liver or the spleen, when divided and pressed. The kidneys were also drained of their blood. The sinuses within the head were loaded with dark blood. The dura mater was pale; but the vessels of the pia mater were delicately filled with florid blood. There was no palpable serous effusion.

H. A dog weighing between forty and fifty

pounds bled from the carotids, lost thirty-seven ounces of blood, and died in seventeen minutes. The heart and larger vessels were found nearly empty; the lungs were much blanched; the liver too was pale, and nearly bloodless. The viscera in general were well drained of their blood. The dura mater contained little blood. On the pia mater were several vessels of a florid colour, but not turgidly filled. This brain seemed upon the whole more depleted than usual. The lateral sinuses were however well filled; and a small quantity of serum was found within the ventricles, and at the basis of the brain.

I, Both jugular veins of a dog weighing eighteen pounds, were opened at the same instant. In three minutes he was convulsed, and died in rather less than six, having lost eleven ounces of blood. The left side of the heart was found empty, but the right was filled with blood. The lungs were pale. The abdominal viscera were nearly bloodless, the exception of the liver and spleen, which contained a moderate quantity. The dura mater was pale, and the sinuses moderately filled. There were numerous vessels on the surface of the brain and pia mater moderately injected with red blood. The membranes were slightly coloured red, exhibiting somewhat the appearance of what is called bloodshot; and there was slight serosity in the ventricles.

K, This dog had both carotids tied; the nerves (it is believed the eighth pairs), being inci-



dentally included in the ligatures. The dog became instantly uneasy and much agitated. The respiration was slow; there were attempts to cough and vomit, and two or three times a little bloody froth was expectorated. For several hours he could move about when roused. He was dull, but not lethargic. He refused food and drink, and died in about eleven hours. Many vessels of a florid colour, but not greatly distended with blood, were seen ramifying on the dura mater. The veins on the surface and between the convolutions of the brain, were neither so numerous nor so distended, as we have seen them on other occasions. But the membranes were covered with numerous minute vessels, delicately injected with bright red blood. The sinuses at the basis of the skull were filled with dark blood.

L, Both carotids, (including nerves), and both jugulars, were tied in this dog, an operation which he survived twelve hours. The symptoms were much the same as in the preceding dog.

His eyes (especially the left), were red and suffused. The vessels of the dura mater were remarkably turgid, and all the sinuses were much loaded with blood. Both the larger and the smaller vessels of the pia mater were fully injected with red blood. Not only the pia mater through its whole extent, but the cineritious substance of the brain itself, had a suffused, reddened, and as it were bloodshot appearance. In short, this brain was

gorged with blood in all its minuter vessels, and there was a little serum in the ventricles.

M, This dog was poisoned with prussic acid.—He became insensible and motionless in one minute from its administration, and in three minutes the heart ceased to pulsate. The brain was every where turgid with blood. The veins and sinuses were loaded and congested; and it was quite evident, that this and the brain of the dog L, contained beyond all doubt or dispute, a much larger quantity of red blood than the brains of any of the animals which had been bled to death.

A, G, and H, are examples of depletion from simple arterial hæmorrhagy; B and I, of uncomplicated venous hæmorrhagy. C and D afford examples of more rapid hæmorrhagy and death, from the knife of the butcher. In E the carotids were tied, with the view of arresting the supply of blood to the brain, and the jugulars were opened for the purpose of general depletion, and with the expectation of voiding the brain to the greatest possible extent. In F, on the contrary, the jugulars were tied with the view of obstructing the return of blood from the head, while one carotid artery was laid open, and the animal allowed to bleed to death as a comparative experiment. The brain of E was accordingly found to be much more depleted of blood than the brain of F.

I know that the carotids, jugulars, or both, may be tied in dogs with impunity. We attribute, therefore, the death of K and L to the inclusion of the

eighth pair of nerves in the ligatures. K and L, therefore, afford examples of brains not depleted by previous hæmorrhagy. With the same view, the dog M was killed by the prussic acid. And these comparative experiments afforded us the most satisfactory proof, that the other brains had been really depleted by bleeding, and their vessels drained of a very sensible proportion of the red blood usually contained by them.

It is remarkable, I think, that in whatever manner these animals were bled to death, whether from arteries or veins, or both,—whether the hæmorrhage was rapid or slow,—whatever time, in short, was necessary to terminate their life, death did not take place till nearly the same or a proportional quantity of blood was lost. The sheep D, slaughtered by the butcher, died in two minutes; E, bled from the jugular, survived twenty-three minutes; and F, killed by arterial hæmorrhage, lived nineteen minutes; and the quantities of blood lost by them respectively, were thirty-four, thirty-eight, and thirty-seven and a half fluid ounces. Of the dogs, one of twenty pounds weight lost fifteen ounces from the femoral arteries; another weighing between forty and fifty pounds, lost thirty-seven ounces from the carotids; and a third, whose weight was<sup>o</sup> eighteen pounds, lost from the jugular veins eleven ounces of blood\*.

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\* Drelincourt obtained sixty ounces of blood from a mastiff in half an hour: “Sanguis, universè collectus, uncias

The summary of these observations, in so far as they apply to our present subject of inquiry, may be thus stated,—that though we cannot, by any means of general depletion, entirely or nearly empty the vascular system of the brain, as we can the vessels of the other parts of the body, it is yet possible, by profuse hæmorrhagies, to drain it of a sensible portion of its red blood;—that the place of this spoliation seems to be supplied both by extra and intravascular serum, and that watery effusion within the head is a pretty constant concomitant or consequence of great sanguineous depletion.

If, instead of bleeding, as in our examples, “*usque ad mortem*,” we were to bleed animals more sparingly and repeatedly, I have no doubt that we should succeed in draining the brain of a much larger quantity of its red blood; but in such experiments we should, I think, find a larger effusion of serum, and be satisfied that many vessels, destined to circulate red blood, were filled with serum only, and even the larger trunks with a very thin and diluted blood.

In cachexies, in cases of inanition, and in cases of great sanguineous depletion, whether by venesection

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“<sup>o</sup> quadraginta octo pependit. Amissam reputo libram unam :  
 “*sint ergò medicæ libræ quinque intra horam dimidiam,*  
 “*arteriis molossi propulsæ.*” He does not give the weight of this dog, which, according to our observed proportions, must have exceeded seventy pounds at least.—*Drelincourtii Canicidia*, can. 1ma.

tion or by spontaneous hæmorrhage, we might expect the brain to exhibit such appearances as are here supposed. Lieutaud, in his *Précis de la Médecine Pratique*, has described a cachexia of this kind, by the very characteristic name of *Anæmia*. In this disease the vessels are found nearly drained of their red blood; and Lieutaud tells us, that he has met with cases in which, on opening the head, the chest, and abdomen, all the vessels, large as well as small, were found containing scarcely any blood; and he mentions one case of a man forty-five years of age, who, after having been most profusely bled for an acute disease, under which he had for some time before laboured, died suddenly of syncope, and in the vessels of whose brain he could scarcely discover a trace of blood\*. There is an account of a singular disease, which is said to have appeared some years ago as a local epidemic amongst the workmen of a particular gallery in the coal-mines near Valenciennes, by Professor Hallé, in the 9th volume of the *Journal de Médecine*. This disease seems to have begun with symptoms of gastric and intestinal irritation, and to have terminated in anæmia. Four individuals suffering under this disease, were sent to Paris for examination. The whole surface of the body was without colour; not the skin only, but the conjunctiva, the inside of the eyelids, of the lips, mouth and tongue, were deprived of their na-

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\* *Précis de la Médecine Pratique*, p. 72.

tural colour. Even the larger veins in the bend of the arm and on the back of the hand, we are told, were so empty, or at least so devoid of colour and convexity, that they could not be discerned. One of these died, and on dissection all the vessels, arteries, and veins, in the three cavities of the body, were found nearly destitute of blood, or containing only a small quantity of serous fluid. The vessels of the trunk were equally empty. In the left ventricle of the heart a coagulum was observed, without any perceptible portion of colouring matter, and the heart itself was as pale as muscles are found to be after washing or maceration. Within the cranium the sinuses were nearly empty, the brain itself was white, its cineritious substance was pale, and little distinguishable from the medullary. Between two and three scruples of serum were found in the left ventricle, and the choroid plexus was of a palish red\*.

Now, in cases like this, where little or no red blood remains in any part of the system, it seems no way surprising that the vessels of the brain should exhibit at least the appearance of great depletion, while they might, in fact, contain no small quantity of serous fluid, or of the almost colourless blood, which was circulated during life. I do not hazard this observation on mere conjecture. I have just had

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\* Journal de Médecine, Chirurgie, et Pharmacie, &c. par Corvisart, Leroux, et Boyer, tom. ix.

an opportunity of examining, along with my friend Dr Combe, the body of a man who exhibited, during life, as perfect an example of anæmia, as any perhaps on record. This man had been for eight months under the regular care and observation of Dr Combe, by whom, perhaps, a full account of this interesting case may at some future meeting be laid before the Society. At Dr Combe's request, I had visited *Hind* two or three times while under his care; and, after the most minute examination, I confess I was unable to give to his complaint any other more definite designation than that of cachexia or anæmia. His countenance and his skin every where was of a pale transparent yellow bombycinous colour, such as, on a first inspection, would naturally suggest the possibility of a liver disease; but then the conjunctiva had nothing of this yellow tinge, neither the urine nor stools gave evidence of any hepatic obstruction, and neither pain nor fulness could be detected in the hypochondriac or epigastric regions. His lips were pallid and bleached; and thus he languished for months, without his complaints assuming any more marked or decided character. For some days before his death his breathing became more difficult than usual; the last twenty-four hours of his existence were passed in a state of lethargy; and on the 29th of January he died.

For our present purpose, it is enough to remark, that the viscera of the thorax and abdomen exhibited no appearance of structural disease. The

heart was flaccid and remarkably pale, containing no blood, with the exception of a web-like, soft, and pale coloured coagulum, loosely attached to the valves and columnæ carneæ. The large bloodvessels were quite empty, with the exception of the abdominal cava, in which was found a thin darkish-coloured fluid, which seemed also scantily to pervade other vessels of the abdominal viscera. The body in general was, however, nearly bloodless. On dividing the integuments of the cranium, a reddish serum only flowed out. The bones themselves were bleached, insomuch that the cranium, instead of its usual blue and sanguineous hue, displayed a whiteness as perfect as the best prepared skulls in our anatomical museums. The dura mater was uncommonly pale, bloodless, and transparent, except only in the course of the longitudinal sinus, which was distinguished by a faint pink tint. About an ounce of thin pink-coloured serum seemed to escape from between the membranes. The sinuses contained only a serum of the same description. The larger vessels ramifying over the hemispheres, and between the convolutions of the brain, were all conspicuous, from the colour given to them by the same pale pink-coloured fluid, with which they were filled, though not distended. The vessels of the basis of the brain, cerebellum, and medulla elongata, contained little or no coloured fluid. The medullary part of the brain was uncommonly white, and the cineritious part was of the palest grey colour. About



three ounces of pink-coloured serum were found occupying the basis cranii and vertebral theca. The choroid plexus was very pale, but its vessels not emptier than usual. The ventricles, corpora striata and thalami, were pale and bloodless, and within the ventricles there was perhaps about a drachm of fluid. The brain generally might be described as soft and watery. Upon the whole, in the examination of this body, we could find little to which the pathologist could attach any importance, other than the want of the usual circulating fluid, and a remarkable ossification of a portion of the dura mater.

The vessels of this brain, however, are far from furnishing an example of unqualified depletion. Compared with the rest of the body, I would say that they contained more than the usual relative quantity of fluid which had circulated during life; a pale and colourless blood, it is true, but in such quantity within the head, that had it been less serous,—more highly coloured,—more, in short, like true blood,—the vascular system of this brain would have presented little more striking or remarkable to the eye of the dissector, than a somewhat less than usual turgescence perhaps of the sinuses and larger vessels, and a profusion of effused and interstitial serum.

Having brought these reflections on the depletion of the vascular system of the brain to a close,

we should next have proceeded to investigate the question relative to the repletion or congestion of those vessels, had I not already too far encroached on the time and patience of the Society;—the subject, however, will be resumed at a future meeting.

REFLECTIONS

ON THE

PATHOLOGY OF THE BRAIN.

By GEORGE KELLIE, M. D. &c.

PART II.

*(Read 20th March 1822.)*

**I**N the course of those reflections on the pathology of the brain, which I had the honour to lay before the Society at our meeting on the 6th February, I endeavoured to shew, that there are natural obstacles to the free depletion of the brain, which have no existence in any other part of the system;—that we cannot, in fact, lessen, to any considerable extent, the quantity of blood within the cranium by arteriotomy or venesection;—and that when, by profuse hæmorrhagies, destructive of life, we do succeed in draining the vessels within the head of any sensible portion of red blood, there is commonly found an equivalent to this spoliation in the increased circulation or effusion of serum, serving to maintain the plenitude of the cranium.

If this be the peculiar condition of the brain, and if the obstacle to the free depletion of its vessels depend mainly on the cerebral system being defended from the weight and pressure of the atmosphere by the solid and unyielding cranium, it seemed probable, that, by removing a portion of the skull, and allowing the atmosphere to gravitate upon the brain, we should succeed in producing a much greater depletion of its vessels by general bloodletting than can be otherwise effected.

To ascertain this point, a portion of the cranium of a dog was removed by the trephine. The dura mater was wounded by the saw, and blood flowed from the surface of the brain. The brain was observed to rise and fall alternately, but so as always to fill the cranium; so that the rise was a sort of protrusion through the opening which had been made. One of the carotid arteries was opened, and in a minute or two afterwards there was an evident gradual sinking of the brain from the margin of the opening. While the blood yet flowed from the carotid, the animal was suspended by the ears, with the view of producing the greatest possible depletion of the vessels of the brain, and allowed to remain in this posture for three hours after death. The brain was sensibly depressed below the cranium, and a space left, which was found capable of containing a tea-spoonful of water. On removing the upper portion of the cranium, the brain appeared of diminished size, or shrunk in its dimensions, so that the membranes, instead of be-

ing stretched, seemed loosely extended over it shrivelled-like and unfilled. The membranes and the brain itself were pale and bloodless. No blood was found in any of the sinuses, except at the very terminations of the lateral, at the basis of the cranium. The vessels of the pia mater ramifying between the convolutions of the brain were shrunk, and dwindled to the size of small threads. The choroid plexus was also bloodless, and about a drachm and a half of serum was found effused at the basis of the skull.

Another dog was trepanned with more care, so that a circular portion of bone was removed without wounding the dura mater, which was separated from its adhesion to the cranium for some way round the margin of the opening, by means of a blunt instrument introduced for that purpose. The animal was then bled to death by opening at once the carotid and jugular of one side, suspended by the ears as the former, and examined three hours after death. The brain did not appear so much shrunk within the cranium as in the former dog, but was sensibly depressed. The vessels on its surface were reduced to mere hairs. The brain was remarkably pale, and the choroid plexus bloodless. No blood was found in any of the sinuses, except at the exit of the lateral ones. About a drachm of serum was found at the basis of the brain.

A third dog was trepanned. The dura mater was slit open, the carotids and jugulars were then wounded, and the animal suspended by the heels. Three hours after death, the lateral sinuses at the

basis of the skull contained a good deal of blood. There was a little also within the longitudinal sinus, and about a drachm and a half of blood was found effused between the dura mater and pia mater. The vessels on the surface of the brain were a little more distinct than in the other two dogs, but still very small and bloodless. The substance of the brain, the corpora striata, and choroid plexus, were all very pale. The cerebellum was more vascular and better coloured than the brain. There was a very little serum at the basis.

Comparing, then, these with the observations made on animals bled to death by simple hæmorrhage, it appears that, when the head is entire, the brain still contains a considerable quantity of blood, —when previously perforated, very little: the brain continues to fill the cranium in the one case, and subsides within it in the other.

The same causes which maintain the plenitude of the cranium, and oppose the depletion of the vessels of the brain, may be presumed to present also natural and constant obstacles to the repletion of those vessels; or, as from a consideration of the structure and situation of the brain, it does not appear very conceivable how any portion of its circulating fluid can be withdrawn from within the cranium, without its place being simultaneously occupied by some equivalent; so neither does it seem consistent with the notion of a constant plenitude, that any greater quantity of blood can be forced

within the vessels of the brain, without an equivalent compression or displacement.

There are occurrences and accidents in human life, and some diseases also incident to man, which bear on the question of repletion and congestion, with all the force of direct experiment; for, in these, all the conditions required by an experiment, instituted for the very purpose of ascertaining the possibility or impossibility of forcing more than the natural quantity of red blood into the vascular system of the brain, are present.

I. The first case of this description which offers itself to our consideration, is that of death from suspension, suffocation, or drowning. In all these modes of violent death, respiration is immediately and completely interrupted. The lungs and right side of the heart become congested, and a general obstacle is interposed to the return of the blood by the veins from every part of the body. In the case of suspension, besides the interruption of respiration, the carotid arteries supplying the greater part of the blood to the brain, and the jugular veins returning almost the whole of what is circulated within the head, are compressed by the cord; while the vertebral arteries remaining free from obstruction, are presumed to continue to transmit blood to the cerebrum, so long as the heart continues to act.

For some minutes, then, after the victim has been suspended, blood will probably continue to be

sent to the brain by the vertebral arteries, if not also, in some quantity, by the carotids, while its return from the head must be nearly or altogether intercepted by the compression of the veins, and the interruption of the respiration. Thus the conditions of the case are such as ought to produce fullness and turgidity of the vessels of the brain, if these be capable of such repletion in a healthy state of the viscus; for the vessels of the head, face, and neck, exterior to the cranium, are, from similar conditions, found in a highly gorged and congested state. It was for a long time accordingly believed by physicians, that death from strangulation is necessarily connected with cerebral congestion and apoplexy. The fact, however, is, that the appearances presented by the brains of those who have suffered by hanging or drowning, afford no countenance to this opinion.

Neither Valsalva, nor Morgagni (who discusses the question at some length), seem to have found any signs of plethora or congestion within the heads of the executed criminals, whose bodies they had opportunities of examining. In one dissection, for example, “*Cutis cranium tegens interiore facie sanguiferis turgebat vasculis. Cerebrum nihil, quantum judicare sensus poterant, ab naturali constitutione discrepebat;*” and so in other cases\*.

De Haen, in whose time the question regarding the cause of death in the drowned and suffocated

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\* De Sedibus et Causis, epist. xix.



continued to be much agitated, furnishes us also with several interesting observations and experiments, which prove that neither suspension nor submersion kill by inducing an apoplectic or congested state of the brain. In the dissection of those who had perished in either way, he observed no such appearances. In one hung person, “Ventriculi cerebri superiores nonnihil lymphæ habuere, vix tertius, nihil quartus. Plexus choroidei naturales. Modicus admodum in sinibus lateralibus sanguis.” And in another, “In hoc corpore notamus, in suspenso deesse apoplexiæ signa,—adesse peripneumoniæ.” In a drowned boy, “Dura mater omnino naturalis; pia nonnihil rubicunda; ventriculi vacui omnes; plexus autem choroidei solito turgidiores. In sinibus lateralibus sanguis admodum paucus\*.” Again, in thirteen of the fifteen dogs which were hung or drowned for the purpose of ascertaining the morbid appearances, he could find no signs of apoplexy, neither fulness nor congestion, nor rupture of bloodvessels, within the head †.

The question was some years ago renewed in our own country, the subject having acquired a fresh interest from the discoveries which were making in the physiology of respiration, and from the institu-

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\* De Submersis; caput ii. Ratio Medendi, tom. viii. par. ii.

† De Resuscitanda Vitæ Suffocatorum, Suspensorum, &c. caput ii. Ratio Medendi, tom. ix.

tion every where of societies for the restoration of suspended animation.

Mr Kite and Mr Coleman were the most distinguished champions on either side of the question, the former defending the old doctrine, and the latter the new. Mr Kite accordingly affirms, that he and his friends generally observed in the brain of drowned animals a certain degree of fulness or distension of the veins \*. Mr Coleman, on the other hand, asserts, as the result of numerous experiments, that the vessels of the head exhibit no appearance of distension in hung or drowned animals.

The trachea of a dog was laid bare, and secured by a ligature ; in less than four minutes he ceased to struggle. The veins of the head, Mr Coleman assures us, were less distended than natural. The two carotids of a dog were secured, and in half an hour afterwards he was hanged. On removing a large portion of the cranium, the vessels, says Mr Coleman, were much less distended than in ordinary death †.

On this subject I am indebted to the liberal courtesy of Dr Monro, to whom, as Professor of Anatomy in this University, the bodies of executed criminals are commonly sent for dissection, for some very interesting information, and for an opportunity of myself examining the brain of one who had been hung. “ I may mention a fact,” says the Professor

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\* Essays on Submersion.

† Coleman on Natural and Suspended Respiration.

in one of his communications which I omitted formerly, viz. “ that I examined the brain of a person who was hung, and found no internal congestion, but a great deal of blood accumulated in the vessels of the integuments.”

Shortly after this, I think on Friday, the 7th of December last, a female was hung at Montrose, and the body being forwarded to Dr Monro for dissection, he very obligingly favoured me with the following notes of the observations which he had made on her brain : “ The veins of the integuments of the head were much distended with blood. There was a slight effusion of a bloody water between the arachnoid coat and pia mater ; and, on removing the membranes, the brain was found to be rather of a paler colour than usual, and felt remarkably soft, so that it gave way at the corpus callosum, upon which some reddish coloured fluid was discharged from the lateral ventricles, but owing to the rupture I could not ascertain its quantity. The brain was much softer internally than externally, so that I could not demonstrate any of the deeper parts to my pupils,— a circumstance which never before occurred to me during the nineteen years I have been a professor. Since I wrote to you I have found a few observations I had made on the brain, and, amongst them, particular mention is made of the softness of the brains of criminals.”

On the 9th January last two pirates, Heaman and Gautier, were hung at Leith, and Dr

Monro very politely afforded me the opportunity of being present at the examination he was to make of the brain of one of them immediately after execution. The bodies, on arriving at the theatre in the College, were still warm, and their limbs flexible. Their countenances were livid, not much swollen, and no way distorted. Their mouths were shut, and their eyelids open. One eye of each subject was more reddened and suffused than the other. There was no frothy mucus about their mouths, nor did the rectum or bladder of either appear to have been voided during execution. I have been informed, indeed, that these men seemed to die speedily, and with little struggle or apparent suffering. There was no dislocation of the neck, no wound nor laceration of the integuments, though the mark of the rope was distinctly visible on the neck of each. I have remarked that one eye only of each subject was much reddened and suffused, and I observed also that the corresponding side of the face of each was evidently more livid than the other, and the truth of this observation was admitted by several of the gentlemen present, to whom I made the remark. The manner in which the instrument of death is adjusted affords, I think, a ready and natural explanation of the fact. As the noose of the cord is adjusted by the executioner on one side of the neck, it becomes, as it were, the point of suspension, so that, by the weight of the victim, it slips upwards from the neck on that side towards the mastoidal process behind the ear; and

there is, consequently, a space on this side corresponding to the rising of the noose, which is not embraced by the cord, and where the veins, returning the blood from the head, are subjected to little, if any, pressure. The mark of the rope, accordingly, did not form a circle round the whole neck, but was observed to rise obliquely upwards, behind the ear, on that side on which the eye was the least suffused, and the countenance the least livid.

On dividing the scalp the blood flowed freely, and in such quantity as to afford ample proof of the congestion of the vessels exterior to the cranium. The dura mater adhered very firmly to the bones, but exhibited no deviation from its usual appearance. All the sinuses contained blood, but in no extraordinary quantity. The larger vessels on the surface, and between the convolutions of the brain, were but moderately filled, and the pia mater was, upon the whole, paler, and less vascular, than we often find it in ordinary cases. About half an ounce of colourless fluid was found at the basis cranii, and there was some appearance of serosity between the membranes. The texture of the brain was rather soft, but the cineritious and medullary portions of its substance exhibited, as to colour and vascularity, nothing characteristic or remarkable. No sooner was the brain removed than the blood, yet warm, began to rise and flow profusely from the divided sinuses and vessels at the base of the skull. Rather more than a pound escaped in this way, and afterwards coagulated on the floor.

It is remarked by Morgagni, that the fluid state of the blood in the dead bodies of those who have suffered by suspension or strangulation, accounts for the little appearance of fulness of the vascular system within the head, although the integuments of the head and face are gorged with blood: For, on the removal of the cord, he observes, that the fluid blood will easily flow back from the brain and its sinuses, towards the heart, through uninterrupted vessels, so large and pervious as the internal jugulars are, while it cannot so easily find its way through the numerous ramifications of the smaller cutaneous veins\*.

But if we consider this matter rightly, we shall, I think, be led to a very different conclusion. The

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\* Porro, idem sanguinis fluor, qui in iis erat quos, cum sani essent, violentia externa strangulavit, admirationem minuit quod in iisdem Valsalva cerebrum invenerit ab naturali statu nihil discrepans, aut crassioris meningis vasa nonnihil dumtaxat sanguine turgida, cum interea cutis cranium tegentis interiora vascula, et quæ oculis circumjecta sunt, aut per retiformen horum tunicam, aut per aurium tympanum feruntur, adeo turgent; ut aliæ harum partium inflammatae viderentur, nonnullæ, ut membrana tympani, et annexa ossicula, tinctæ etiam sanguine apparerent. Soluta enim laqueo, amplissimisque viis internarum jugularium venarum redituro sanguini reclusis, multo maxima hujus, quippe fluidi, pars è cerebri sinibus, venisque majoribus in hos desinentibus, facile defluxit, cum is qui per anfractus, angustiasque magis dissitarum venularum minus expeditum haberet, in iis subsisteret, nonnullis earum exceptis, quas aut magis plenas, aut minus resistentes laqueus ante disruptisset, aut alia exterior violentia.—*Morgagni, Epist. xviii. 11.*

cord cannot be, and never is, removed till the subject is cut down and laid in the horizontal posture, when the blood can have no tendency to gravitate towards the heart. The occurrence, indeed, which took place after the removal of Gautier's brain proves the contrary,—that, in the horizontal posture, the blood, while fluid, must be rather gravitating upon the brain, and that the fluid congested in the right side of the heart, cava, and jugulars, is actually pressing upon that within the sinuses of the brain, for when the vessels were divided within the head, the blood flowed upwards into the skull.

I have long known, indeed, that, in consequence of this very circumstance, much more blood has seemed, in many cases, to have been contained within the head than actually existed within its vessels. Sometimes in opening the head, the sinuses are wounded by the saw, or torn in removing the upper portion of the skull from its strong adhesion to the dura mater, and then I have not unfrequently seen blood continue to escape in such quantity as the sinuses themselves were incapable of containing, and that, too, without the veins on the surface of the brain appearing to have been thereby emptied, so that I have never doubted that the greater part of this blood had pressed upwards from the jugulars and cava. When the brain is removed it is very usual for the blood to press upwards, and flow into the skull.

I have sometimes, however, called the attention of those assisting me in dissections to a very diffe-

rent state of the vessels within and without the head, —cases in which the jugulars and cava were empty, while the sinuses and veins within the head contained their usual quantity of blood. This state of the vessels was observed in the case of anæmia, given in the former part of this paper, and in the following case.

Mr L.'s child, a girl about two years of age, was, on the 12th November last, attacked with symptoms of acute bronchitis, a disease at that time very prevalent among young people. The case was from the beginning actively treated by bloodletting, blisters, and antimonials, and, in a few days, the dyspnoea, and more urgent symptoms, seemed considerably relieved; still the child did not convalesce, but continued hectic and feverish. Nothing farther remarkable occurred till the 2d December, when it was reported to me that the child for a day or two had at times experienced great difficulty in swallowing, and that now the dysphagia was complete. A careful examination of the external and internal fauces satisfied me that there was no inflammation or tumor. A blister was applied to the nape of the neck, and in a few hours from the time it began to act, the power of swallowing was recovered. On the 4th, however, the dysphagia returned, and was again relieved by blistering the external fauces. The relief, however, was of short duration. On the 6th the child could swallow nothing, and notwithstanding every remedy used, the power of deglutition could never be restored. She was thirsty and



anxious to swallow, but not a drop of any thing whatever passed downwards from this time till the 12th, when she sunk apparently from mere exhaustion. On dissection, the fauces, pharynx, and œsophagus were found in a perfectly natural state. The trachea and bronchiæ were loaded with purulent fluid, and there was adhesion of the left side of the lungs to the pleura. All the abdominal viscera were remarkably pale and bloodless. Very little blood was found in the heart. The sinus venosus and cava, and the carotids and jugulars of both sides, were perfectly empty. The sinuses of the dura mater were well filled, and the veins of the pia mater ramifying between the convolutions of the brain, were plethoric and congested. At the basis cranii, and in the vertebral theca, there was found rather more than an ounce of serous fluid, but none in the ventricles.

I have seen, also, in the animals which we bled to death, the vessels of the neck, till they entered the bony foramen of the cranium, empty, though the communicating sinuses within the skull were well filled with blood.

I consider these observations on the relative state of congestion of the veins, within and without the head, as good illustrations of the difficulty of repleting, or depleting, the vascular system of the brain; for, on the one hand, we find blood pressing upon the brain from the congested jugulars, cava, and right side of the heart, without finding any entrance into the head, till the sinuses are wounded,

and the brain removed; and, on the other, the vessels within the head are found replenished with blood, though their continuations without the head are empty.

II. Another condition, which has been presumed to have a tendency to produce fulness and congestion of the vessels of the brain, and consequently to act as an occasional or exciting cause of apoplexy, is stooping or other low positions of the head. I believe, however, that the influence of posture has, in this respect, been somewhat overrated. I think it quite certain, at least, that in a previously sound and healthy condition of the brain and its vessels, no change of posture can impel into, or confine more or less blood within those vessels than naturally belongs to them, though I am willing to allow that the general pressure of the circulating fluid may, in this way, be, under certain circumstances, increased or diminished, and the circulation through the head accelerated, retarded, or disturbed.

Healthy individuals may stand on their head, hang by their heels, or change the posture of their bodies in every possible way, as we observe in the gambols of school-boys, or the more curious feats of adult and professed tumblers, without sustaining the slightest injury or inconvenience. Many of the occupations and employments of industrious life are carried on in a continued stooping posture, as in the acts of weeding, reaping, gleaning, planting, digging, washing, and many such like. Miners, shoemakers

too, and other artizans, work the whole day in very constrained and stooping postures; and the sailor, in the act of furling and reefing, hangs over the yard-arm in such a way that his head is not unfrequently the lowest part of his body. In some instances of deformity, decrepitude, and disease, we occasionally observe individuals bent almost double, and compelled to move about with their head stooping almost to the ground. Yet in these, and many other such examples of constrained situation and stooping posture, whether from choice, necessity, or infirmity, the circulation within the head continues to go on freely, and these subjects have not, I apprehend, been observed to be more prone to congestive diseases of the brain, to palsy and apoplexy, than those whose more fortunate circumstances permit them "*erectos ad sidera tollere vultus.*"

The heart continues to pulsate for several minutes after every other sign of life has been destroyed, by an adequate dose of hydrocyanic acid, and the blood continues fluid for a still longer time. In order, therefore, to ascertain, as far as such an experiment can do, the total effect of the gravitation of the blood upon the vessels of the brain, I immediately, after administering a destructive dose of prussic acid to two dogs, suspended the one by the heels, and the other by the ears, and allowing them to remain thus suspended for eighteen hours, they were taken down for examination.

In the dog suspended by the ears, the muzzle, gums, tongue, and integuments of the head were

found pale and bloodless, and the jugulars empty. The dura mater had few conspicuous vessels; those of the pia mater were tolerably large and numerous, but not turgid; the brain itself was well coloured, seemingly with arterial blood, especially within the ventricles; the sinuses did not contain much blood; the serous effusion at the basis of the brain amounted to nearly a drachm. In the dog suspended by the heels, all the external parts of the head were much congested and highly coloured, and there was a small effusion of blood under the fascia of the temporal muscles; all the veins of the head, and the jugulars of the neck, were loaded with blood, even to turgescence. The dura mater exhibited no increase of vascularity. The veins of the pia mater were rather more filled, and the sinuses were decidedly more turgid than in the other dog, but there was no palpable quantity of serum in any part.

Thus, the effect of posture on the parts exterior to the skull is very great; in the one dog, the integuments were pale, and the vessels completely empty; in the other, they were filled and congested to the greatest possible degree. Within the head the contrast was but trifling. The sinuses beyond all doubt were loaded in the one case, and rather empty in the other; the difference of appearance in the other parts of the brain was but little striking.

III. Some diseases of the heart, and of its larger

vessels, constitute cases in which we might expect to find the brain more plethoric and congested than usual. In obstruction of the auriculo-ventricular valves, an obstacle exists to the free return of the venous blood from the head; and in muscular enlargement of the heart, not unfrequently complicated with contraction of the descending aorta, the impetus of the blood upon the brain is often powerfully increased. Sometimes, too, these conditions, either of which seem so well calculated to produce fulness and congestion of the vessels within the head, are found united in the same case, obstruction viz. to the return of venous, and increased impetus of arterial blood. Yet, I believe it will be found that, in a sound condition of the brain and its vessels, such diseases of the heart have little or no tendency to produce lethargy, palsy or apoplexy, nor by consequence plethora, congestion, or disordered circulation within the head, although the livid, bloated, and sometimes swollen countenance, and the turgid and throbbing neck, bear ample testimony to the existence of plethora, obstruction, and congestion, in the vessels exterior to the cranium. Of the several cases of enlargement, and of other structural diseases of the heart, which have come under my own observation, not one of the patients had lethargic or apoplectic symptoms. One only had a partial paralytic affection of the right arm.

During the spring 1814, Mr B. had been complaining a good deal, but without any peculiar or

definite symptoms. It had merely been remarked by his friends, that he was looking ill, and did not enjoy his usual health and spirits. He continued, however, to vacate his affairs during a time of great commercial embarrassment, without any particular inconvenience or inability. On the 1st March, he complained to me for the first time of an inconvenience he experienced in the act of writing, a necessity of writing more slowly than usual, and an inability of forming the letters with his accustomed accuracy. This disability was accompanied with headach and vertigo, and being considered by me as a paralytic affection, depending on increased pressure on the vascular system of the brain, he was bled on the 3d, 7th, and 12th March. His bowels were kept open, and an anti-phlogistic regimen enjoined, by which means these symptoms were relieved, but not removed. He continued, however, to go abroad, and do business as usual, so that after the 12th March I ceased to visit him at his house, and occasionally only used to meet him in the street.

On the 1st May I was again consulted, and informed that his nights were restless and sleepless,—that he complained of a sense of oppression at the breast, and of suffocation at the throat, whenever he laid himself down on bed, or assumed the horizontal and recumbent posture,—of palpitation, of headach, and vertigo,—of costiveness, and of discharge of blood by the anus,—of breathlessness on the slightest exertion, and of general prostration of

strength. These symptoms led me to examine very particularly the condition of the heart, and of the larger vessels of the thorax and neck. From the tumultuous throbbing over a great extent of the chest, the laboured action of the heart, and the pulsation of the aortic arch, both felt and seen immediately above the sternum, I entertained little doubt of the existence of aneurism of the aorta, and of enlargement of the heart. Yet I did not at this visit consider things so far advanced as immediately to endanger life. The action of the heart was, however, too powerful, and could not be controlled; the blood was projected with surprising force upon the aortic arch, the carotids, and the head; alarming hæmorrhagies took place both from the nostrils, and per anum; the horizontal position was insufferable, and several days and nights were passed without sleep in the chair. The stomach became affected and retained nothing,—violent sickness and bilious vomiting ensued,—he was restless, anxious, and uneasy, and on the 13th of the same month he died.

The heart was found enlarged to twice the usual size, not by simple dilatation, but by a real increase of muscular structure, as well as of capacity. The aorta, also, from its origin, through the whole extent of its arch, had nearly twice the ordinary capacity;—its coats were thickened,—the internal coat was inflamed and studded with several gritty tubercles or ossifications. All the valves were sound. There was an ounce of water in the peri-

cardium. The lungs and abdominal viscera were sound. The head was not opened.

Now, notwithstanding the slight paralytic affection of the right arm, and the headach and vertigo of which Mr B. complained, I consider this, upon the whole, as one of those cases where an apparent exception may be said rather to confirm than invalidate the rule; for powerful and awful as were the exertions of this heart, there was yet no stupor, no lethargy, no apoplexy, no congestion therefore, no rupture of vessels within the head, although such congestion and rupture happened in other parts of the system.

Mr G., with a numerous train of distressing symptoms, which too well marked the existence of enlargement of the heart, and of the violent propulsive energy of that viscus, had one only characteristic of any disturbance within the head. On looking upwards to the whitened ceiling of a room, he saw a darkened spectrum which vanished and reappeared with great regularity. It was soon discovered that the appearance of this umbra was synchronous with the systole of the heart, so that he used often, in my presence, to count his pulse with the utmost precision, by keeping his eye fixed on the ceiling, and numbering every appearance of the spectrum. But, independently of this curious symptom, every other function of the brain, during a protracted state of suffering, remained undisturbed till the last moment of his existence.

On dissection, the heart was found greatly en-



larged, but without any increased thickness of its parietes. The auricular valves on the left side were rigid and thickened.

Mr L.'s case was very similar in its progress to the preceding. I had no doubt of the nature of the disease from the moment he consulted me. The heart acted with amazing force; the pulse varied from a hundred to a hundred and twenty; the respiration was easily affected by the slightest exertion, and there was much of anxiety and restlessness. The more urgent symptoms were occasionally relieved and parried by bloodletting. After several months of suffering, his legs began to swell,—his breathing to be more and more difficult, and in one of those paroxysms of dyspnœa he died. But the functions of the brain remained unimpaired and unaffected during the whole of his illness.

The heart was much enlarged; the ascending aorta was rather larger than usual, but immediately below the origin of the left subclavian, there was a remarkable contraction to the extent of fully one-half of its diameter, below which the vessel again swelled out into a sort of aneurism by dilatation. In this case, then, with an enlarged heart pulsating with furious energy, and an aorta stric- tured just below the origin of those vessels through which the blood is directly impelled on the brain, we had yet no symptoms of congested or deranged circulation within the head.

A still more remarkable case of solid enlarge-

ment of the heart, with obstructed aorta, is recorded by Dr Graham, in the 5th volume of the Transactions of the London Medico-Chirurgical Society.

The walls of the left ventricle were about an inch in thickness. The aorta expanded unusually near its origin, so as to form a kind of pouch, but after giving off the branches to the head, and superior extremities, its diameter was preternaturally contracted. It was continued of this diminished size till after its union with the canalis arteriosus, where it was completely impervious. The arteria innominata, the left subclavian, the superior intercostals, and mammary arteries, were much enlarged. The throbbing of the carotids and subclavians was very remarkable; there was dyspnœa and palpitation of the heart; the pulse was at one report 100 and firm; at another it is described as full, strong and sharp; he had febrile attacks, pain, nausea and vomiting; but in the whole account of this interesting case, I do not find the slightest notice of any symptom marking disorder of the circulation within the head\*.

Few physicians have enjoyed more extensive opportunities of observing the effects of structural diseases of the heart than Corvisart, and yet with a strong prejudice in favour of the supposed connection between these diseases and apoplexy, he frank-

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\* Transactions of the Medico-Chirurgical Society of London, vol. v.

ly avows that his practice does not furnish him with a single fact of this kind, which he adds is a little extraordinary, considering the numerous cases of this disease which have fallen under his observation\*.

The proper inference, I think, is, that such structural diseases of the heart, however much they may seem calculated to force blood upon the brain, or to impede its return by the veins, have yet little or no effect on the circulation within the head; or, that whatever tendency such diseases of the heart and larger vessels may have to produce plethora, congestion, or deranged circulation within the head, that tendency is opposed and counteracted by the physical situation of the brain, and the peculiar confinement of its vascular system.

It would be still more extraordinary, however, if coexistent diseases of the brain and of the heart were not occasionally met with.

The texture of some part of the brain may be softened or otherwise diseased, tumors or changes of structure may be formed or advancing to maturity within the head, or the arteries of the brain may be themselves in a morbid state, dilated, atheromatous, ossified, or aneurismal. In all or any of these cases, the coexistence of structural diseases of the heart, and larger vessels, may materially influence the character, severity, and progress of the cerebral disease. Thus may a subject with struc-

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\* *Maladies de Cœur*, par Corvisart.

tural disease of the heart, have symptoms also of a morbid condition of the brain ; or, be simultaneously affected with headach, vertigo, amaurosis, paralysis, or coma, or die suddenly from apoplexy ; and the sooner, perhaps, that a diseased heart was propelling the blood with increased energy upon, or retarding its return from the brain. In fact, if we attend to those cases where cerebral symptoms have coexisted with those of diseased heart, we shall often, perhaps always, find that there was an independent disease of the brain itself, quite adequate to the production of all the symptoms referable to that organ, though no disease whatever had existed in the heart or larger vessels.

For example, a mantua-maker, twenty-four years of age, who laboured under symptoms of active aneurism of the heart, had also complete paralysis of the left side. The heart on dissection was found to occupy “ the greater part of the chest, and had “ acquired,” says Corvisart, “ an extraordinary size, “ considering the small stature of the subject. The “ cavity of the left ventricle had acquired a very con- “ siderable size, and its parietes were much thicker “ than natural. The aortic opening and sigmoid “ valves were free and natural, but the mitral valves “ were tuberculated\*.”

Now, had the chest alone been opened in this case, it might have been produced as an example of paralysis, arising from the increased propulsive

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\* Corvisart.

energy of this enlarged and obstructed heart, forcing into or confining too much blood within the vessels of the brain. But on opening the head, the substance of the right hemisphere of the brain was found in a state of manifest decomposition, of a grey colour, and of the consistence of thick paste.

Malpighi's case, too, which Corvisart cites as an example of connexion between apoplexy and diseases of the heart and large vessels, is still, in my apprehension, one rather of coexistence than of causal connexion. This eminent person was afflicted with gout and stone, was subject to palpitations of the heart, and died of a second stroke of apoplexy. The heart was found to be thickened and enlarged, and the right ventricle of the brain is said to have contained two pounds of blood. But, then, all the cerebral vessels were varicose and diseased, one of the most common perhaps of all the causes of sanguineous apoplexy with rupture of vessels and effusion of blood\*.

I had lately an opportunity, along with more than one member of this Society, of witnessing the dissection of the body of a man who had died rather suddenly in one of our public institutions. This man, thirty-two years of age, was admitted on the 9th of January last, for the treatment of amaurosis. He complained besides of pain of head, particularly over the right eyebrow. The right eye had become suddenly affected about five months previous-

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\* Vide Baglivi, Morgagni, and Corvisart.

ly, and shortly after the left one. He had been subject to headach for six years, though in other respects his general health appeared good. On the seventh day after admission, he complained of great pain over the right eye, had dyspnœa, cough and vomiting, frequent pulse, and thirst. On the ninth, without any alleviation of the previous symptoms, he had great tendency to sleep; coma supervened with laborious respiration, his countenance became pale and ghastly, and at one o'clock next day he died.

“ Upon examining the brain, the veins upon the  
 “ surface were not much distended with blood, nor  
 “ were the smaller arteries very conspicuous. There  
 “ was a slight effusion of serum under the arachnoid  
 “ coat. The brain throughout felt particularly firm,  
 “ but, when cut into, did not exhibit any marks of  
 “ great vascularity; and there was no fluid in the  
 “ ventricles. Upon examining the basis of the brain,  
 “ there was no effusion as on the surface, but there  
 “ was a marked change in the arteries. The carotids,  
 “ the vertebrales, basilar, and those vessels forming the  
 “ circle of Willis, were much thickened in their coats,  
 “ and felt extremely tough; and the branches sup-  
 “ plying the brain, particularly the anterior cerebri  
 “ of the left side, were studded with various spots of  
 “ ossification, which, however, did not render them  
 “ brittle. The carotids, where they were in contact  
 “ with the optic nerves, were much thickened in their  
 “ coats, and the whole of the arteries felt so tough that  
 “ they could easily be followed out. The optic nerves  
 “ were also very firm. The cavity of the thorax was

“ quite healthy, excepting the heart, which was much  
 “ enlarged; when cut into, the ventricles, particu-  
 “ larly the left, were found much thickened. There  
 “ was a large polypus of a yellow colour distending  
 “ the right auricle, and passing for some way into  
 “ both cavæ; it descended for some way into the  
 “ ventricle, and completely obstructed the passage.  
 “ All the valves of the heart were healthy\*.”

I have produced this case as a very interesting example of the coexistence of structural disease of the heart and brain, and of their mutual independence. The power of the systemic heart was greatly increased, and the pulmonary was much obstructed. It was just such a heart as seems calculated at once to force blood upon the vessels of the brain, and to retard its return by the veins, and so to produce plethora, congestion, or rupture of those vessels. The cerebral arteries were themselves diseased, enlarged somewhat, changed in structure, and here and there studded with atheromatous or ossified spots;—they were, in short, in a state of predisposition to congestion and rupture; and I do not, I think, hazard much when I take it upon me to say, that this man was thereby predisposed to apoplexy, and that, if his heart had been perfectly sound,—had he laboured under no other disease or predisposition than what was found to exist in the arteries of the brain,—he might indeed have lived longer, but would sooner or later have become paralytic or apoplectic. The predisposition, however,

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\* Extract from the Public Records of the Charity.

was not as yet sufficiently far advanced; and thus even so powerful an exciting cause as an enlarged and obstructed heart, was unable to produce congestion or rupture of diseased arteries,—and if not of vessels in a well known state of predisposition, how little reason does there remain for believing, that structural diseases of the heart and larger bloodvessels have any great efficiency in the production of plethora or rupture within the head, in a healthy state of the vascular system of the brain?

IV. Ligatures and tumors compressing the vessels of the neck, so as to impede or retard the free return of blood from the head,—the pressure of thoracic and abdominal enlargements and tumors on the aorta or cava, or other impediments to the free passage of the blood to or from the heart, constitute another class of cases, which have commonly been considered as having a natural tendency to force more than the usual quantity of blood upon the brain, and which have accordingly been very generally regarded as efficient occasional causes of apoplexy. I think, however, it will not be difficult to shew, that even these have little influence upon the circulation within the head, in a sound and natural condition of the brain and its vessels.

Mr Abernethy tied the carotid of a man who had been gored in the neck by a cow. The patient soon after became delirious, convulsed in the left side, paralytic in the right, and died thirty hours after the ligature of the artery. Appearances of



inflammation and effusion of blood were found on the surface of the brain, a gelatinous deposition beneath the arachnoid membrane, and watery effusion within the ventricles. Upon reflection, Mr Abernethy observes, “ I can form no other opinion of the case than that which first struck me, which is, that though stopping the supply of blood to the brain did not for several hours produce any apparent derangement in the functions of that organ, yet such a state was gradually occasioned by it, and which was attended, like the effects of concussion of the brain, with inflammation.” And he adds, “ that an effusion of blood in the left hemisphere of the brain would affect the opposite side of the body in the same manner that cutting off the supply of blood to the left side appears in this instance to have done\*.”

At a time when we had but little, if any experience of the effect produced on the circulation within the head, by the ligature of one of the principal vessels supplying the brain with blood, Mr Abernethy's reflections were quite natural, as the event of this unfortunate case was in perfect accordance with, what I may be pardoned for calling, a pathological prejudice of our schools; so that, if this had remained a solitary experiment, it might now have stood in our way as a good illustration of the common doctrine.

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\* Surgical Observations, by John Abernethy, F. R. S. London 1804.

The carotid, however, has been since so frequently tied, and with such unvaried success, as to convince us that the obstruction of this vessel has no tendency whatever to produce derangement of the circulation within the head, or of the functions of the brain, insomuch that, in cases of aneurism, the ligature of the common carotid has now become an established and fearless operation of surgery. So little, indeed, is this operation, in so far as its influence on the functions of the brain is concerned, now dreaded, that surgeons have even ventured to tie the common carotid, with the intention, and with the effect too of interrupting or weakening vascular action and turgescence of parts exterior to the cranium, without, however, the fear of deranging, and without actually having deranged, in the slightest degree, the circulation within the head, as in those cases of aneurism by anastomosis in the orbit, which have been cured by tying the common trunk of the carotid by Mr Travers and by Mr Dalrymple\*.

There is probably no known case in which the circulation through both carotids has been interrupted in man; but in the lower animals, whose brains are supplied with blood by arteries similar in their origin and distribution to our own, both carotids have been tied with perfect impunity. The ancients indeed believed, that the compression of

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\* Medico-Chirurgical Transactions, vols. ii. and vi.

those vessels was followed by stupor and lethargy\*. But we have a series of experiments on the ligature of the carotids, from Galen down to Valsalva, and to the present day, which prove, contrary to this prejudice, that the ligature of both arteries produces no disturbance whatever in the functions of the brain †. The animals on which I have repeated this experiment, though kept alive for several days afterwards, appeared to suffer no inconvenience whatever.

Almost the whole of the blood circulated through the brain, is returned to the heart by the internal jugulars, and yet the obstruction or ligature of one of these veins at least, does not appear to be productive of any derangement of the circulation within the head,—of none at least capable of disturbing the functions of the brain.

Mr Simmons, in extirpating a tumor from the neck, divided and tied the internal jugular vein. The patient recovered; and it is especially remarked, that no morbid affection of the head was the consequence of this operation ‡.

A similar case is related in the 5th volume of the Edinburgh Medical Essays. After laying the

\* Carotides (vel arteriæ somniferæ) a ΚΑΡΟΣ, *sopor*.

† Non parvi momenti est pro Galeno, de tribus canibus, in quibus Valsalva ejus iteravit experimentum, ne unum quidem fuisse qui aut sopore, aut obmutescencia corriperetur.—*Morgagni*, Epist. 19-29.

‡ Medical Facts and Observations, vol. viii.

vein bare a considerable way, Dr Simson observes, “ I found it confounded at the lower part with the substance of the tumor ; and therefore, putting a ligature round the vein, I tied it, and then cut away the remaining part of the tumor below.” The cerebral functions appear to have suffered no disturbance from the ligature of the vein\*.

Mr Lardner, after describing a case in which he found the internal jugular obliterated by a tumor in the neck of a woman, remarks, as one of the interesting circumstances of the case, the very slight disturbance of the functions of the brain, notwithstanding so great a dérangement of its circulating system had taken place †.

Another case, very like to this, occurred in the practice of Mr Young. “ A sailor, about fifty years of age, had an ulcer in the fauces, which communicated with a chain of tumors surrounding the larynx and pharynx, and affording great impediments to respiration and deglutition. The tumors increased during several months, when the patient died, worn out by the irritation and pain which they excited. When dissected, these tumors were found to consist of a soft medullary matter, contained in a cellular structure. One of the tumors projected into the fauces, and had excited ulceration, which extended to the epiglottis. The carotid artery and the external jugular

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\* Edinburgh Medical Essays, vol. v.

† Edinburgh Medical and Surgical Journal, vol. vii.

“ vein were enveloped in these morbid growths.  
 “ The cavity of the artery was of its natural size,  
 “ and its coats were healthy. The left internal ju-  
 “ gular vein, for the extent of two inches, where it  
 “ passed through the tumors, was completely obli-  
 “ terated\*.”

We had lately a patient in the Leith Dispensary, a man of the name of Veitch, who died suffocated by the pressure of a large medullary sarcoma, which occupied the whole of the neck, extending from ear to ear, and from the chin to the sternum. Deglutition was impeded, respiration difficult, and the countenance swollen and livid. On dissection, all the vessels of the neck were found involved in this large tumor, whose weight may be fairly estimated at somewhat more than two pounds; and yet, as I am informed by Dr Macaulay, who had the charge of him during the last days of his existence, no symptoms occurred indicative of disturbance of the circulation within the head.

It was long believed, on the authority of Aristotle, that the ligature or compression of both internal jugulars was productive of stupor and insensibility. The experiment, however, repeated by Galen, and since by others, has not been followed by any such remarkable result. There are contradictions, it is true, in the observations of different experimenters; but the general conclusion seems to

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\* Hodgson's Treatise on the Diseases of the Arteries and Veins.

be, that the ligature of the jugular veins of the lower animals is not necessarily followed by any disturbance of the functions of the brain. Morgagni, however, has, by a critical examination of those experiments, rendered it doubtful what were the veins actually secured in most of them, whether external or internal. He remarks, that the experimenters have not generally been sufficiently explicit in their accounts,—that they have sometimes omitted to name the animals operated on, or to tell in what part of the neck the veins had been tied in the dog, when that animal is distinctly mentioned,—that few had made the necessary examination after putting the animals to death, in order to ascertain whether or not the vessels had been properly tied and had continued obstructed, or had made themselves acquainted with the peculiar distribution and communications of those vessels\*.

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\* “ Sed neque dixit, quo in genere animalium, nec qua in  
 “ colli sede, venas constrinxerit. Quorum utrumque eos cogi-  
 “ tasse, æquum fuerat, qui ejus vellent experimentum in du-  
 “ bium vocare. Nam quod ad primum attinet, recentiores  
 “ hæc fere solent in canibus, quos ille vel mortuos quam raro  
 “ dissecuerit, neminem fugere potest in ejus lectione versa-  
 “ tum : quibus autem vivis animalibus ad experimenta utere-  
 “ tur, quod ad nervos quidem attinet, scimus ; quod vero ad  
 “ sanguifera vasa, si rectè memini, nescimus : et tamen aliam  
 “ in aliis animalium generibus esse posse vasorum dispositio-  
 “ nem, aut communicationem, quis neget ? quando haud raro  
 “ in eodem genere, imo vel in uno eodemque animali, si quæ  
 “ sunt in dextro, et sinistro latere inter se comparemus, varias  
 “ illas esse, deprehendimus. Quamobrem et illum alterum

These objections seemed to Morgagni to be less applicable to the experiments of Lamure and Desnoves, than to those of others. Lamure tied the jugulars of a dog, as the experiment is described, immediately below the bifurcation, without effect; but when he tied the same veins lower down the neck of another, the animal was affected with profound stupor. Desnoves, by his account, tied both the external and internal jugulars in two dogs, and the animals are said only to have become heavy and sad\*. Morgagni, therefore, concludes, that Galen might have really tied the internal jugulars without any remarkable occurrence in the subject of experiment, seeing that Desnoves had secured

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“spectare decet, id est qua in colli sede ligatæ fuerint venæ  
 “jugulares. Nam inter altiorem, et inferiorem sedem, sive  
 “ob eam quæ modo indicata est, sive ob constantem causam  
 “vel in canibus discrimen esse, conjicias licet ex Cl. Lamurii  
 “experimentis. Hic enim cum aliud inquirens, multorum vi-  
 “ventium canum jugulares internas venas spectaret, hasque  
 “ad breve temporis spatium in duobus obligandas curasset;  
 “in primo quidem postquam vinculum injectum fuerat infra  
 “earum bifurcationes, soporem adnotavit nullum; in altero  
 “autem cum injectum esset, quo ad fieri potuit, proprius tho-  
 “racem, canis, inquit, incidit in profundum soporem.”

\* “Et sane utrasque olim videtur intellexisse Novesius qui  
 “externis simul internisque vincula injecit. Quod cum in uno,  
 “itemque in altero fecisse canem, animadvertit quidem (id quod  
 “apud Loverum non invenio) signa capitis facti ponderosio-  
 “res, et lacrymas aliquot; sed canibus aliquo post tempore  
 “mortuis, nihil quidquam seri extra aut intra cranium effusi  
 “deprehendit.”—*Morgagni, Lib. ii. Epist. 19. § 32.*

both the external and the internal veins, without any greater disturbances having followed \*. There is still something imperfect and unsatisfactory in the account of these experiments; and I have reason to think, that even those of Lamure and Desnoves are open to the doubts which Morgagni has cast on the experiments of their predecessors. In fact, the dog, the common subject of all those experiments, has, in reference to the anatomy of man, no internal jugular.

The common jugular, as I shall call it, is a very large vein situated superficially immediately under the skin of the neck of the dog, which, in its division and distribution, may be very aptly compared to the common carotid, for, like it, the common jugular ascends obliquely from the chest, giving off no remarkable branch but one, the transverse cervical, which supplies the parts about the shoulder, till it reaches a little higher than the upper third of the neck, where it bifurcates at a very acute angle into two principal and equal sized branches, the most external and continuous of which ascends to the head, gives some veins to the occiput, and then, a little before the meatus auditorius externus, it turns under the coronoid process of the jaw-bone,

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\* “ Utcunque id est; certe Novesii observationes ostendunt, potuisse Galenum læsionem adnotatu dignam nullam videre paulo postquam internas adstrinxisset jugulares venas, quando internis simul, externisque constrictis, non plura Novesius animadvertit.”—*Morgagni*, Lib. ii. Epist. 19.



gives off numerous branches to the neighbouring parts, and enters the cranium a small vein, to receive the blood from the sinuses of the brain; so that this small branch which perforates the cranium, is the only true internal jugular. The other great bifurcating branch of the common jugular, runs upwards and forwards to the face and throat, —soon divides into two veins of nearly equal size, the one proceeding to the larynx and adjacent parts, while the other, running upwards over the angle of the lower jaw, gives branches to the head and face, —passes under the zygoma to the orbit, and is now the ophthalmic vein, which receives a large portion of the blood of the sinuses of the brain. The branch which I have described passing to the larynx and adjacent parts of the throat, gives off a very slender vein which becomes recurrent, plunges deep into the neck, and running down nearly in contact with, and parallel to the carotid, and between it and the trachea, communicates with the subclavian vein; so that, when I first observed this recurrent branch, slender as it is, I concluded it to be the internal jugular. It is, however, no other than a very small reflected branch from the laryngeal vein.

The veins which have generally been tied in the dog, can, I think, have been no others than the common jugulars; and when these are secured, it is evident that all the blood returned from the brain by the internal branches must be intercepted, were it not for the small recurrent branch, which

preserves a communication between the laryngeal vein and the subclavian, and by which some portion of blood will still be conducted from the head to the heart.

If, in any of those experiments, one only of the great bifurcating branches (mistaken for the internal jugulars) had been tied, blood would still be transmitted from the brain by the other,—by the ophthalmic vein, if the internal,—and by the internal jugular branch, if the facial or external branch had alone been tied.

I have myself tied the common jugulars in dogs, but they suffered not the slightest inconvenience. They never refused their food, and seemed as lively and active as they had ever before been. One dog, on the third day after the experiment, contrived to rid himself of the rope with which he was secured, made his escape, and I am informed, is still living and well.

It is by no means clear what were the veins secured by Desnoves, as internal and external jugulars. If he tied the two great bifurcating branches, he performed a less satisfactory experiment than if he had tied the common jugulars; but if, mistaking the small recurrent veins for the internal jugulars, he tied these and the common trunks, then he must have intercepted all the blood which can directly be returned from the head by the jugular system of vessels. It seemed to me, therefore, desirable, that the result of such an experiment should be fairly ascertained. The common jugulars, accordingly, and

the recurrent veins, were all carefully secured by ligature as low in the neck as they could well be reached. The dog at first seemed to suffer no inconvenience. The two following days, however, he kept himself in the recumbent or crouching posture, was dull, but not stupid, paralytic, or lethargic; took his food regularly, and seemed pleased when caressed. On the fourth day, he regained his spirits, and continued brisk, lively, and so perfectly recovered, that he gnawed asunder his rope, and nearly made his escape. On the seventh day, being to all appearance in perfect health and strength, he was killed in one minute by a dose of prussic acid. Next morning we examined the head and neck. All the veins were found to have been accurately tied, and to have continued perfectly obstructed by the ligature. The vessels of the pia mater and brain were moderately filled, and the sinuses were distended with blood. There was no serous effusion, and the brain had a healthy and natural appearance. The repetition of this experiment was attended with no difference of result worthy of notice. We may rest satisfied, therefore, that the obstruction of the whole jugular system of veins in the dog has no tendency to disturb much the circulation, or to congest the vascular system of the brain. The truth is, that although the direct return of the blood by these veins be very completely intercepted, it may yet find a sufficiently free, though more circuitous passage to the heart, not only by the vertebral sinuses, which appear to me very large

in the dog, and which communicate freely with the sinuses of the brain, but also by forcing those anastomoses, which exist between the transverse cervical veins at the lower part of the neck and shoulders, and the branches of the external and internal bifurcations of the jugulars, which descend from the integuments of the head, and from the upper and back part of the neck. And that those anastomoses are very free, is, I think, demonstrated by the observation, that the ligature of the common jugulars did not occasion congestion even of the integuments of the head and other parts above the ligature.

Not only have the carotid arteries and the jugular veins of dogs been secured and obstructed in separate experiments, without stupor and insensibility having been induced, as the ancients had supposed; but both carotids and both jugulars have been tied up in the same animal, without having occasioned the slightest disturbance of the circulation within the head, of which we have an example in the following experiment by the Baron Swieten:

“ In cane, cui ante octiduum abscideram nervos re-  
 “ currentes, ligavi utramque carotidem, nec potui  
 “ observare illum aliquid mali inde pati: inveni  
 “ enim hoc animal post alios octo dies elapsos vege-  
 “ tum et elacre; ligavi tunc venas jugulares sine  
 “ ullo observabili malo. Post quatuor dies inveni  
 “ canem sanum omnino. Examinans tunc ligatu-  
 “ ras carotidibus injectas inveni illas firmissime hæ-  
 “ rere, et thrombum valde densum et compactum

“ hæerere inter ligaturam et cor. Aperto cranio in  
 “ cerebro nihil mutatum apparebat, imo cerebri vo-  
 “ lumen potius auctum quam minutum appare-  
 “ bat \*.”

As the common jugulars were, I presume, the only veins tied in this experiment, and as the arteries and veins were obstructed at successive periods of eight days, it seemed necessary to have it repeated. The common jugulars, therefore, were tied at the lower part of the neck ; and immediately after the recurrent veins and carotid arteries were secured by ligature, from which the nerves were carefully excluded. For two days after this operation, the dog was dull and somewhat heavy, but afterwards recovered his spirits and activity. He was kept alive till the seventh day, when he was killed by the prussic acid. On dissection, the integuments of the head, and the contents of the cranium, seemed in a perfectly healthy and natural state ; the veins of the pia mater were moderately distended, and the sinuses at the basis were well filled ; there was no effusion. The veins and arteries which had been tied continued obstructed.

I know of no example in which both internal jugulars have been obliterated or obstructed in man ; but there is a case related by Dr William Hunter, the consequence of which to the circulation within the head, must have been equivalent to the obstruction of both these veins. The case was one

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\* Commentaria in Aphorismos Boerhaavii, tom. i. 173.

of aneurism of the aorta, in which the vena cava superior, and the common trunk of the left subclavian and jugular vein, were so much compressed by the aneurismal tumor, as hardly to have any thing left of their natural capacity and appearance. The account of the appearances observed in the dissection of this case, is preceded by a very full history of the symptoms and sufferings of the unfortunate individual; but amongst these I do not find one of functional derangement of the brain\*.

As to tumors and enlargements within the abdominal cavity interrupting or rendering difficult the passage of the blood through the aorta or cava,—the effects of these appear also more than doubtful when we know, that the channels of these large vessels have been entirely intercepted in cases where no symptom of disturbed circulation within the head had been observed.

Of the obliteration of the aorta within the thorax, I have already produced Dr Graham's case as an example; another instance of the same kind occurred to M. Paris of Paris; and a third is referred to by Sir Astley Cooper,—in none of which was plethora or congestion of the brain indicated by the symptoms.

In dogs, Sir Astley Cooper tied the abdominal aorta; and, without any dread of thereby forcing too much blood within the vessels of the brain, he afterwards, in a desperate case of aneurism, ventured

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\* Medical Observations and Inquiries, vol. i. p. 323.

to secure by ligature the same vessel within the abdomen of a man who survived the operation forty hours. The day after the operation, the patient complained of pain all over his body, more particularly in the head; and in the same report, it is observed, that the carotids beat with considerable force, but no symptoms of congested brain seem to have followed\*.

The descending cava has frequently been found obstructed, and even altogether obliterated, within the cavity of the abdomen, by the pressure of tumors and other causes, of which we have examples recorded by Dr Baillie, Mr Wilson, Mr Cline, Mr Hodgson †, and others; but I do not find that any apoplectic disease has been remarked as a consequence of such obstruction. And yet, in the case of obstructed cava by Mr Wilson, the venous system of the brain must have been exposed to more than usual hazard of congestion; for, amongst other anastomosing channels through which the blood was forced to seek its course to the heart, were the veins coming from the sinuses of the dura mater in the theca vertebralis and the sinuses themselves, which, together with the veins entering them, it is observed by Mr Wilson, were much enlarged; and the communications

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\* Surgical Essays by A. Cooper and B. Travers, Esq. London, 1818.

† Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge, vol. i. and iii.; and Hodgson's Diseases of Arteries and Veins,

between them and the sacral and lumbar veins were, he assures us, rendered very apparent by the blood contained in them.

I have thus passed in rapid review the most important of those circumstances, which, from the earliest era of medicine, have been presumed to have a powerful and undoubted tendency to force blood into, or to confine it within, the vessels of the brain, and so to produce a dangerous morbid congestion of that viscus,—circumstances which accordingly have very generally been enumerated by systematic physicians as the principal exciting causes of comatose diseases; and though I am aware of many objections,—though I know but too well the unlucky *pour* and *contre* which embarrass us in almost every subject of medical inquiry, I think a case has been fairly made out, proving that the agency of such causes has been greatly overrated;—that nature has guarded, with peculiar care, the brain and its vessels against such accidents from repletion and depletion, as they must otherwise have been constantly exposed to;—and that while the structure of this organ remains *healthy* and *unchanged*, and *its vessels sound*, those causes are little capable of occasioning plethora, congestion, effusions, or comatose diseases.

The real causes of apoplexy are changes which take place in the brain itself,—disorganisations and structural alterations of its own texture, and of its vessels, and membranes. There are other points, however, connected with the pathology of the brain, and



with the causes of the comata which still remain to be scrutinized, and especially the effects of those agents which have a direct and immediate influence on the cerebral functions, such as alcohol, the narcotic poisons, and cold; but the consideration of these is necessarily deferred to some future occasion.



ON DISLOCATION  
OF THE  
HIP AND SHOULDER JOINTS.

By ADAM HUNTER, M. D. Fellow of the Royal College of Surgeons, one of the Surgeons and Vaccinators to the Royal Public Dispensary.

(*Read 3d April 1822.*)

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**T**HE remarks which I am about to submit to the consideration of the Society, owe their origin to the circumstance of my having performed, during the winter of 1814-15, the dissection of a *recent un-reduced* dislocation of the hip-joint, and having witnessed two of the shoulder; one recent, the other apparently of a very old date, both of which had, however, been reduced. Of the appearances which these dissections exhibited, I fortunately took accurate notes, which I have now arranged, with the view of filling up, in some measure, a blank that still exists in this department of pathology.

*Dislocation of the Hip-Joint.*

Upon the subject being placed on the table, certain external appearances were very observable. There was a great want of uniformity between the inferior extremities, arising from the shortening of the right or dislocated limb, a difference existing between their apparent length of at least one inch,—the toes were turned inward,—and there was a vast enlargement and fulness of the upper part of the thigh and right hip, which completely concealed the trochanter. There likewise existed a fracture of the right humerus,—numerous severe contusions were perceptible on the trunk and limbs,—and it was known that the right shoulder joint had been luxated, and reduced after the patient was brought to the hospital, by my friend Dr James Gordon, who was house-surgeon for the week at the London Hospital, where the case occurred.

Such were the external appearances. I commenced the dissection by removing the integuments from the gluteus maximus. This exhibited the subcutaneous cellular tissue, and likewise the cellular membrane, which dips between the muscular fasciculi, enormously loaded with coagulated blood, particularly towards the posterior origin of the muscle. On separating the gluteus maximus from its various origins, and from its subjacent connections, the head of the femur was brought into

view, passing underneath the edge of the gluteus medius, lying deeply imbedded in coagulated blood, and bound down most firmly on the sacro-sciatic notch, by the inferior and posterior edge of this muscle, which passed over the neck of the bone. On the removal of the effused blood, I found that the head of the femur lay between the pyriformis muscle and the great sacro-sciatic nerve, pressing the muscle against the superior and posterior part of the notch, and the nerve against the inferior and anterior; the pressure upon the nerve being so firm as to render it as flat, and about as broad, as the sterno-thyroid muscle.

I now raised the gluteus medius, which set the thigh bone free, and likewise displayed such an appearance of destruction and confusion, as it is impossible for language to describe. To say which was the attachment of the gluteus minimus, of the pyriformis, of the obturator internus, or in fact of any of the smaller muscles inserted into the vicinity of the trochanter, was impossible; but when I said "I raised the gluteus medius which set the thigh bone free," a suspicion of what had taken place must have occurred to every one's mind, viz. that all the small muscles near the joint, and the ligaments which belonged to it, were torn from their attachments;—and this was literally the fact, as the head of the femur, which was previously kept fixed and immoveable by the stricture formed by the inferior edge of the gluteus medius, could now be made to move freely in every direc-

tion. Having removed the coagulated blood that lay on the surface of the gluteus minimus, I found that it was so much bruised and lacerated by the head of the femur passing over its surface, as to be reduced to a gelatinous or pultaceous mass.

Having thus satisfactorily ascertained the extent of the injury that had been inflicted on those muscles, whose vicinity to the centre of motion necessarily exposed them, in my opinion, to the hazard of great injury, I next directed my attention to the state of the ligaments, both of which I found were completely torn from the head and neck of the femur.

To bring the acetabulum into view, I cut across the large muscles that descend from the pelvis, at a short distance from the trochanter. The effect of this was completely to separate the limb from the trunk, an event that afforded another proof besides the one already stated, of all the small muscles having been lacerated from their attachments. The capsular ligament was, throughout its whole extent, attached to the circumference of the acetabulum, and the round ligament quite entire, but slightly raised from its attachment, was lying in the bottom of the socket.

Along with these morbid appearances, there was a dislocation of the sacro-iliac synchondrosis, together with a fracture of the os innominatum of the right side, which traversed the acetabulum.

Before I proceed to make any remarks, or at-

tempt to draw any inferences from the morbid appearances which I have detailed, I should wish it to be fully understood, that I am aware that the preceding is an extreme case, and cannot be adopted as an exemplification of the extent of injury to which the soft parts are liable in all cases of dislocation. I am inclined, however, to think, that in many cases of this accident, the soft parts do actually suffer to a much greater extent than surgeons are willing to admit, or than the perfect cures which are obtained, where the bone has been early replaced, would lead them to suspect.

While expressing such an opinion, I am perfectly aware, that Sir Astley Cooper has related the morbid appearances discovered on the dissection, of three old cases of luxation of the hip-joint; but the examination of these cases took place at such a distance of time from the date of the several accidents, as enabled the wonder-working powers of the system to repair, to a most astonishing extent, the injury which the parts had sustained. In one of these cases, that of luxation into the foramen ovale, “*the pectinalis muscle and adductor brevis had been lacerated, but were united by tendon,* and the psoas muscle and iliacus internus, the glutei and pyriformis, were all upon the stretch.” In the other two cases, no mention whatever is made of the condition in which these small muscles were found; and in the fourth species, or rather the first according to his arrangement, Sir A.

Cooper, apparently without any dissection, expresses his opinion, that extension of the muscular fibre is the only result of the displacement; as at the 30th page of his first essay on dislocations, he says, “ In the dislocation upwards, the pyriformis and glutei muscles are all shortened, as are also the triceps and pectineus, the psoas magnus and iliacus internus, the rectus, the semi-tendinosus and semi-membranosus, and one head of the biceps. The obturator externus is shortened, but the obturator internus, gemini and quadratus, are put upon the stretch. The muscles which more than any others resist the reduction, are the glutei and triceps.”

That, in luxations of the hip-joint, such changes may take place, I shall not attempt to deny; and could I suppose that the dislocating force acted slowly and gradually, so as to enable the muscles to accommodate themselves to the new force applied to them, then I think it sufficiently probable, that simple extension of the muscular fibres would be the only change produced. But when I consider the usual intensity of the dislocating force, and the celerity with which it acts, I am inclined to call in question the general correctness of the above view.

Whoever will take the trouble to direct his attention to the formation of the hip-joint in the skeleton, will find that the acetabulum is from three-fourths to one inch in its perpendicular depth; and consequently in the living body, where its margin is surrounded on all sides by its cartilaginous ring, it must be, and in fact is, considerably

deeper. The head of the femur, therefore, in leaving its socket, must rise through a space varying from one inch to one inch and a quarter, and consequently the origins and attachments of the smaller muscles in its neighbourhood, must be proportionally separated from each other; and that, too, at an instant of time when the new motion which the head of the femur is compelled to make by the dislocating force, stimulates them to a more powerful and energetic action; such an action, indeed, as I conceive must, while their points of attachment are forcibly separated from each other, in all probability rupture some of their tendons. These small muscles, viz. the quadratus, gemini, pyriformis, iliacus internus, obturator externus and internus, and the gluteus minimus, while in a state of quiescence, vary in their respective lengths from  $2\frac{1}{2}$  to about 6 inches, and from their vicinity to the centre of motion, none of them, even at the utmost extent of motion of which the thigh is ordinarily susceptible, is stretched more than a fifth or a sixth part of their original length; and in that case, their associated actions with the other moving powers of the leg, cause them to relax to their utmost limits. But when a new motion is imparted to the head of the femur, and that motion is conveyed through so long and powerful a lever as the whole length of the limb, these muscles are all, I conceive, as guardians of the joint, as well as rotators of the limb, excited to an inordinate action, so as to resist, and if possible counteract, the dislocating force. From the irresisti-



ble power, however, of this new agent, their points of attachment are separated to a greater extent than any of their natural and associated actions admit; and the rupture of their tendons is, I apprehend, in many instances the effect of the contending energy of these opposing forces.

There is now, I believe, not a doubt entertained, that the principal resistance to the reduction of the dislocated limb, immediately after the injury, resides almost, or I may say exclusively, in the agency of the muscles, stimulated to inordinate and spasmodic contraction by the altered position of the head of the bone. The above case, however, points out a new and additional force, exerted by one muscle, which has not been noticed by any previous writer that I have had an opportunity of consulting. The head of the femur, it will be remembered, had passed from beneath the inferior edge of the gluteus medius muscle,—the neck was firmly embraced by its margin,—the trochanter lay concealed behind its fleshy belly; and during life, while the stimulus of altered position existed, and the irritability of the muscle must have kept it in a state of continued violent contraction, the neck of the thigh-bone must have been embraced with immense force. Had reduction, therefore, been attempted, during the life of the individual, the head of the bone must have experienced a very powerful resistance to its return, from this cause. The stricture thus exerted by the margin of this muscle, passing over the neck of the thigh-bone, like a cord over a pulley, will, I think, most probably

be the case in every instance of dislocation upon the sacro-sciatic notch, and consequently may be adduced, as a most admirable illustration of the propriety of that preparatory treatment, of lowering the tone of the muscular fibre, previous to the attempts at reduction being made, which has been so highly recommended, and practised with so much success, by Sir Astley Cooper.

Before I conclude this part of my observations, I may be allowed to pay a just tribute to the merits of Mr Hey of Leeds, whose clear and discerning mind, led him to form an opinion regarding the precise situation of the head of the femur, in luxation upon the sacro-sciatic notch, the accuracy of which has been most amply confirmed, by the morbid appearances that were exhibited by the dissection of this case.

#### *Dislocation of the Shoulder Joint.*

The injuries, which the soft parts of the right shoulder-joint of the same individual, had sustained, were of equal extent with those which the hip had suffered, and may be thus shortly described. The integuments having been dissected from the top of the shoulder, so as completely to expose the deltoid muscle, a large lacerated wound of its fleshy belly was discovered, through which the finger could be passed down to the fractured extremities of the humerus. The deltoid being reflected from its ori-

gins and attachments, a large quantity of coagulated blood was brought into view, which being removed, it was found, that the tendon of the supraspinatus muscle was ruptured, and had torn along with it the upper part of the capsular ligament to a very considerable extent. The coracoid process of the scapula was fractured into two pieces, one of which was attached to the tendon of the pectoralis minor, the other to the united tendons of the coraco-brachialis and short head of the biceps. The long head of the biceps was entire. The humerus was fractured into several pieces rather above its middle.

In addition to the injuries presented by this case, I may mention, that, during the dissection of the shoulder joint of a very old man, which I also witnessed, the long head of the biceps had been torn, and had become adherent to the groove on the head of the humerus, and the tendon of the supraspinatus had likewise been ruptured. There was great emaciation of the whole extremity, but nothing was known of the individual during life, so that it was impossible to ascertain what symptoms he laboured under, or what could have given rise to such changes.

The first suggestion that occurred to me, from an attentive consideration of the morbid changes, detected in these two cases, was relative to the effects, consequent upon the rupture of the tendon of the supra-spinatus muscle, an accident which, in some cases, I suspected might give rise, to that

paralysis and wasting of the deltoid muscle, which has been observed to attend luxations, and other injuries to which the shoulder is frequently exposed.

Boyer, in giving his prognosis of luxations of the shoulder-joint, concludes by saying, that “ We have  
 “ seen, in a luxation of the humerus downwards  
 “ and inwards, a paralysis of the deltoid muscle,  
 “ produced by the violent contusion of the circum-  
 “ flex nerve, which is chiefly bestowed on that  
 “ muscle.” From my friend Dr Abercrombie, I have learned that he had met with one case, of paralysis and wasting of the deltoid after dislocation, which was recovered from at the expiration of a-year. Of the same affection numerous examples are to be met with, which, in the opinion of almost every practitioner, are believed to depend on some injury, directly sustained by the muscle itself, or, according to Boyer, by its nerve, which produces such a change in the action of its intimate vessels, as that interstitial absorption is the consequence.

I am inclined, however, to add another link to the chain, and to suspect, that either a rupture of the tendon of the supra-spinatus muscle, or some alteration in its powers, may be a primary cause. To this opinion I have been led, by a careful consideration of the mechanism of the shoulder-joint, and by what I conceive to be the principal use of the supra-spinatus, viz. that by its contraction,

it commences and most materially assists in the motion of abduction of the arm.

From the relative position of the origin and insertion of the deltoid muscle, it appears, that should contraction take place in the direct line of its fibres, at a moment when the arm is lying quiescent by the side, the probable effect would be simply, a forcible elevation of the head of the bone, against the inferior part of the acromion process, or, at least, its contraction would operate under very disadvantageous circumstances for commencing the very first steps of abduction. It therefore must require the aid of some other muscle, to bring the arm into such a position, as shall render the contraction of the deltoid efficient, for completing the motion of abduction and elevation. This auxiliary power seems to reside in the supra-spinatus muscle, the effect of whose contraction is such, as to place the humerus in that position, in which the contraction of the deltoid shall not operate, in the line of a perpendicular dropping from the acromion. If such be the use of the supra-spinatus, then I can conceive, that the primary step of abduction being lost by the rupture of its tendon, the contraction of the deltoid will, in all probability, prove incapable of commencing it; and that therefore, from inaction, its powers will be ultimately destroyed. Or, it perhaps may not be too hypothetical to say, that, in the associated actions of these muscles, the principal stimulus to the contraction of the deltoid,

happens at that point of the action of the supraspinatus, which has brought the humerus into the most favourable attitude, for the deltoid to act upon. If this view of their action was as tenable as it is plausible, then it could easily be seen, that wasting of the deltoid, from a deficiency of due stimulus to its action, would be a highly probable result.

The only other point on which I shall venture to detain the Society, regards the question, how far it is practicable or proper to attempt reduction of a dislocated limb, when it is combined with a fracture of the shaft of the dislocated bone.

On this question Sir Astley Cooper says, “ This case presented unusual difficulties, and the probability is, that dislocation, thus complicated with fracture, will be generally unreducible, as extension cannot be made until three or four months have elapsed from the accident, and then only with strong splints upon the thigh to prevent the liability to the reproduction of the fracture.” On the other hand, Mr Trye remarks, “ When the humerus was fractured in its middle, at the same time that its head was displaced, I found nothing necessary more than slightly to draw the head of the bone forwards, and then lift it into its socket. Here the muscles were altogether passive, and the bone of course met with no resistance when it was lifted into its cavity.”

With this opinion of Mr Trye's, I am quite inclined to agree, as, in the case of fractured and dis-

located humerus, the dissection of which I have related, the same facility of reduction, as what Mr T. mentions, was experienced; and although I cannot unite with him in saying that the muscles were altogether passive, yet I must acknowledge, that the opposing effect of their contraction was entirely lost, by the length to which the inferior fractured portion of the humerus was made to ride over the superior. In similarly complicated cases of the inferior extremity, I fear there is too much truth in the opinion of Sir A. Cooper; as from the powerful muscles attached to the trochanter, and the thick covering of loose muscles by which the femur is surrounded, the displaced bone can be little, if at all, under our command, and where such a complication does occur, the unfortunate sufferers must be led to expect only an imperfect cure. At the same time, Mr Trye's case, and the one I have detailed, are satisfactory proofs, that the opinion of the learned Baronet, is not to be adopted as an universal rule, applicable to all cases of complicated dislocations.

ON THE  
USE OF TOBACCO  
IN  
TETANUS.

BY THOMAS ANDERSON, M. D. Extraordinary Member  
of the Royal Medical Society, Edinburgh, Inspector of  
Health of Shipping, and Member of the Medical Board,  
Port of Spain, Trinidad.

COMMUNICATED BY MR BRYCE.

*(Read 1st May 1822.)*

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**I**N the medical treatment of a disease, in which theory has not yet conducted the practitioner to any sure curative means, I conceive we are warranted in departing from established rules of practice; and I now venture, under this impression, to offer some instances of success in a disease which has long ranked among the reproaches of our art.

Though situated within ten degrees of the line, Tetanus is not a remarkably frequent occurrence in this island; and fewer cases occur in town than in the country. Town occupations do not subject our



negroes so much to its attack, as the habits of those engaged in country employments.

Negroes, I am led to suppose, are much more subject to this disease than whites; for I do not recollect meeting one case among the sailors of the Port, though extensively engaged in that kind of practice. Among the negroes, males (especially the more robust) are more liable to the disease than females, and I have also found it least tractable in them.

During five years' unremitting practice in this town, which contains a population of 10,000 souls, and in its vicinity, I have had frequent opportunities of witnessing this disease. The first case that fell under my observation I treated conformably to the method most recommended, but with an unfortunate result. A second case, which supervened to amputation of the lower extremity, for compound fracture, so late as the 18th day after the operation, which I attended with another practitioner, had also a fatal termination. A third case which I attended with the same gentleman, proved also unsuccessful. All three were robust negro men. In two of the cases, the disease had supervened to trifling wounds of the lower extremities, amongst tendinous parts. In all, opium, mercury, sometimes with salivation, the warm bath, purgatives, blisters, &c. were freely and assiduously employed. In one case, I gave opium to the extent of ten grains every two hours, but it seemed to have little or no effect.

Such indifferent success was mortifying, and much impaired my confidence in the medicines employed; and decided me to substitute other means, in hopes of being more fortunate.

July 1820, I was called to attend a free negress, forty years of age. It seemed a well marked case of trismus traumaticus. She complained of stiffness and pain all over the inferior maxilla, particularly at the angles and articulatory processes, with difficulty of swallowing. She was totally unable to open her mouth, her utmost effort barely sufficing to expose the tip of the tongue; pulse accelerated, and partial perspiration on the chest and neck. This patient, an African, had submitted to the operation of cupping on the temple, as performed in the African way, with a blunt penknife and small callabash; and going abroad, almost immediately after, had exposed herself at work to the vicissitudes of rainy and sultry weather. About five days after the operation, the symptoms, as above described, began to appear. I saw her two days after their appearance.

The attendants were busily employed in rubbing her neck and throat with fish-oil, and heating her apartment to a high temperature, by means of ignited charcoal. These modes are much pursued by the Creole French here in the treatment of tetanus; but unassisted, I have never seen them succeed in the symptomatic disease, though it is not improbable they may have proved useful in the

idiopathic kind, which is known to be of less difficult cure. I directed the frictions to be discontinued, and the charcoal fires to be removed.

Having heard many of the Spanish natives of the adjoining Main, as well as English who had resided at Caraccas, speak confidently of the curative effects of tobacco in tetanus, I was anxious to ascertain its merits, and, therefore, prescribed it in the following manner, similar to what I understood was the practice on the Main. I directed a strong decoction to be made of the fresh leaves of the *Nicotiana Tabaccum* \*, which grows here luxuriously, and the jaws, throat, and chest to be fomented with it for half an hour together, and subsequently, cataplasms of the leaves, boiled till quite tender, to be applied all over the inferior maxilla and throat. The warm bath, into which a quantity of the tobacco decoction had been thrown, was administered every three hours, and a glyster of the same decoction was given twice in the twenty-four hours. The bowels, which had been obstinately constipated, were opened with calomel and gamboge, followed by *Ol. Recini*, and the patient was indulged with the use of her pipe, as far as she could make use of it.

The usual effects of tobacco were produced, though, by no means so decidedly as one might

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\* The tobacco of Trinidad resembles that of the Havannah and Spanish America, in being much milder, and finer flavoured than that of either Virginia or Europe.

imagine, judging from the usual potent effects of the medicine.

Relaxation, indicated by the perspiration, before only partial, becoming general, was the first consequence; and the bowels, after persevering in the tobacco plan, were easily kept open with *Ol. Recini*. A blister was at this time applied to the *nuca colli*, with the view of keeping up a discharge. While these remedies were taking effect, I did not object to the attendants administering such remedies as I considered innocent, and not likely to counteract my own.

The symptoms of trismus remained stationary under this treatment for two days. On the third, the jaw somewhat relaxed, and she was able to open her mouth a little. It had been previously necessary to insert a bit of wood between the jaws, to prevent their closing entirely, and on any attempt to introduce the finger into the mouth, it was bitten. The patient, who had previously resigned herself to her fate, now assumed courage, and acquired hope.

Under a perseverance in the same plan, the subject of this case has been preserved; but there still remains, August 30th, a contraction and impaired use of some of the muscles connected with the angles, the left particularly, of the inferior maxilla: it is however trivial, and is gradually yielding to embrocations.

A few months afterwards I saw her perfectly recovered.

On the evening of the 18th December 1821, I was called to visit a negress, named Acouba, a middle aged African woman, residing in the Port of Spain. I found her in a state of syncope, caused by profuse hæmorrhage from a wound of the hand. On examination I discovered a complete division of the metacarpal bones and enveloping substance of the little and ring fingers.

The bleeding from the divided vessels having stopped during the syncope, I brought the parts into apposition, and supported them together as well as possible by means of adhesive straps, and a retaining bandage. On enquiring how the patient had got her wound, it was explained, that her husband, from whom she had shortly before separated, had, in an accession of jealous fury, attacked her with a sharp cutlass, and would have destroyed her, had not the alarm been given, when he made his escape.

Next day my friend Dr N. attended with me, (and subsequently throughout the case); no hæmorrhage had ensued, and it was determined to attempt a cure by the first intention. Dressings, as before, with the addition of lint, soaked in Tinct. opii, and Ol. oleæ Europ., were applied to the wound. Things went on favourably for some time, union of the parts took place, and even cicatrization had commenced, till the 31st, when some constitutional symptoms, general uneasiness, accelerated pulse, and foul tongue, shewed themselves. She also complained of a spasmodic starting of the wounded hand from time to time, which she could not, by

voluntary effort, prevent or controul, of which she first became sensible the preceding night. This starting was not confined to the hand, but extended along the arm as far as the shoulder. I dressed the wound, in which nothing extraordinary could be observed, and called back an hour after.

The starting of the hand and arm had in this short time become more frequent and intolerable, and the apprehensions I had previously entertained, were now turned into certainty, of tetanus being the disease to be contended with. I, in consequence, with the concurrence of Dr N., promptly decided on the plan of treatment to be adopted, experience having convinced him, as well as myself, of the total inefficacy of the old mode of treatment in traumatic tetanus.

I removed all dressings from the wound, ordered the hand and whole extent of the arm to be fomented with a warm decoction of the Creole tobacco leaves, and a poultice of the boiled leaves to be applied to the wounded hand; prescribed a smart purgative of jalap, with submuriate of mercury, and instituted the use of the tobacco in the following manner :

Several large cauldrons and kettles were directed to be in constant use, in keeping ready strong decoctions of the indigenous tobacco, in its fresh gathered state. A warm bath, in which a proper quantity of this decoction had been infused, was ordered for the patient several times a day,—to be kept immersed in the bath till a sensation of nausea

at stomach, and profuse general perspiration should be induced.

1st January 1822.—Notwithstanding the administration of the bath, as directed, several different times, the symptoms are rather aggravated since yesterday; the convulsive starting continues as before, and extends, like a sudden shock, to the præcordia, at the same time bending the body forwards. The purgative has not operated more than two or three times.

A full dose of castor oil was prescribed. Baths to be continued, with the occasional assistance of an enema of the decoction, so as to keep the system constantly relaxed, and under the sedative influence of the tobacco.

2d January.—Still complains much of startings; says her jaws feel stiff, she has evident difficulty in articulation, pronouncing her words indistinctly; however, she can open her mouth wide with tolerable ease. Tongue still charged.

R. Pulv. Jalap ʒj.

Submur. Hydrarg. gr. xv.

Fiat Pulvis statim sumendus.

3d January.—The application of the tobacco poultice to the wound and hand has caused irritation, and produced an eruption on the parts. Let an emollient one of ochra, be substituted. Tongue still white. Spasms, as yesterday, recurring about every five minutes, any attempt to stand upright, on being supported to the bath, brings on the spasms.

Repeat the castor oil. Continue the treatment as heretofore.

This was assiduously and faithfully done, under my own observation, with the effect of keeping the disease stationary, no very perceptible amendment could be observed till about the 10th, when it was apparent that the symptoms were yielding. The tobacco was, nevertheless, persevered in; but in a degree proportionate to the urgency of the symptoms, and the patient's capability of supporting its debilitating effects.

It is important to note, that, on the first appearance of the disease, the patient was in good case, and nursing a child of two months; her appetite was at this period much impaired, and flesh considerably reduced. It was, in consequence, thought necessary to support her on the most nourishing diet, of an easily digested nature, and allow her a little wine, and merely maintain the action of the tobacco in such a manner as to controul the spasms.

The spasmodic starting of the extremity, though gradually becoming weaker, did not entirely subside till about the 37th day of the disease. The uneasiness about the tongue, which she described as a sense of weight, was still longer. At the present time she is in perfect health, nursing her child, her milk having returned as she recovered health. The fingers, with the exception of the index, are contracted, the joints ankylosed, and, of course, imperfect in their use.

The connexion of the spasmodic symptoms with



the state of the digestive organs was sufficiently striking throughout the disease. The strength of the spasms seemed to be in a direct ratio with the oppressed state of the chylopoietic viscera, as indicated by the tongue. This last was never, until the patient was fairly recovering, what might be called clean. The importance, then, of keeping up a free discharge from the bowels was strikingly indicated.

In the selection of the kind of tobacco best adapted to the treatment of tetanus, I preferred the indigenous sort, from being easily procured, and it may be, moreover, preferable from being so much milder than the Virginian variety. I have, however, no doubt, that the curative effect may be equally well obtained from any kind of the plant, proceeding on the plan I have endeavoured to point out in the detail of the preceding cases.

In the last I had the advantage of employing the remedy in the early stage of the disease, a circumstance, in one so untractable, of no small importance. My experience has not yet served me to learn how far it is to be confided in, when had recourse to in the more advanced stage.

The result of any future observations I may have on this subject, I fully intend to communicate to the Society.

HISTORY  
OF A  
CASE OF ANÆMIA.

By J. S. COMBE, M. D. Fellow of the Royal College of Surgeons, Edinburgh.

*(Read 1st May 1822.)*

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**T**HE following case has been already brought under the notice of the Society by my distinguished preceptor and friend Dr Kellie, in his paper on the Pathology of the Brain, as affording a striking corroboration of his views regarding the circulation within the head in health and disease. It appears to me entitled to still further attention, and to a more minute detail, as exhibiting a well marked instance of a very peculiar disease, which has excited little attention among medical men, and which has been altogether overlooked by any English author with whose writings I am acquainted. Unfortunately, however, such is the allowable diversity of opinion on most medical subjects, that it is very

possible the following case may be viewed in different lights, and receive different appellations; and while some may be disposed to regard the peculiar characteristic from which it derives its denomination of Anæmia, as constituting a morbid state *sui generis*, others may consider the defect of the red circulating mass as an accidental and occasional circumstance, denoting some peculiar change in the assimilative powers, the primary stages of which we have been unable to detect. Doubtful myself which of these opinions may be the most correct, I shall do little more than state correctly the phenomena of the case, and minutely the appearances presented on dissection. One remark only I may at present offer, that if any train of symptoms may be allowed to constitute Anæmia a generic disease, the following may be considered an example of it in its most idiopathic form.

It was in the month of July 1821, that I was first consulted by Alexander Haynes, the subject of this case, on the nature of his complaints. Even at that time I was much struck by his peculiar appearance. He exactly resembled a person just recovering from an attack of syncope; his face, lips, and the whole extent of the surface, were of a deadly pale colour; the albuginea of the eye bluish: his motions and speech were languid; he complained much of weakness; his respiration, free when at rest, became hurried on the slightest exertion; pulse 80, and feeble; tongue covered with a dry

fur; the inner part of the lips and fauces were nearly as colourless as the surface. He says that his bowels are very irregular, generally lax, and that his stools are very dark and foetid; urine reported to be copious and pale; appetite impaired; of late his stomach has rejected almost every sort of food; has constant thirst; he has no pain referable to any part, and a minute examination could not detect any structural derangement of any organ. He is forty-seven years of age; was born and has spent the greater part of his life in the country, engaged in agricultural employments; for a few years has been servant to a corn-merchant, where his duties are neither laborious nor unhealthy. He is married, and has no family; leads a regular and temperate life; has enjoyed perfect health since childhood, and has never been bled. He was advised to use some medicine to correct the state of his bowels, to confine himself to a light diet, and to take gentle exercise.

I saw him again in a few days, and found him nearly in the same state. His stools were consistent, dark and very foetid; urine pale and copious, depositing scarcely any sediment. His wife tells me that it is about two months since he began to complain, but not until his friends had observed his altered complexion: he then lost strength, and said his head troubled him. Of this last symptom, however, he has no distinct recollection; his feet became œdematous, and his appetite failed him. My attention was again drawn towards the skin,

which was of the same waxen colour, soft and delicate, the cellular texture about the eyes and breast being slightly distended with watery effusion. The pulse was feeble, and easily excited by any motion. The veins on the arm and neck were delicate, and could be felt on making pressure, but the colour of the blood did not appear through the skin. It was evident that the patient laboured under great debility, probably from a defective and languid circulation. Some tonic medicines, a mild nutritious diet, with wine, were prescribed, and I was inclined to hope for a favourable termination to the case.

About a fortnight after this he was evidently better, was stronger, and able occasionally to attend to his duty; but I was not at any time confident that there was any change in his complexion. He perspired freely on any exertion, but neither the face nor lips ever acquired any additional tinge. At one time, from the state of his stools and urine, I was led to suspect an affection of the liver; at another, from the thirst, great flow of urine (exceeding the liquid ingesta), and peculiar state of the skin, I was apprehensive of diabetes; but none of these indications remained long stationary.

In September, and occasionally afterwards, he was visited by Dr Kellie and Dr R. Hamilton, from whose able advice I trusted he would derive much benefit. A very minute examination of the case, and a careful consideration of its history, however, scarcely solved the nature of the affection, and

its long continuance and inveteracy rendered our prognosis much more doubtful.

Towards the end of September, he tried the effects of a sea voyage, and afterwards drank the waters of a chalybeate spring. He returned in the middle of October with a loss of flesh and strength, his legs were much swollen, his skin had the same exsanguine appearance, secretion of urine copious, bowels lax, and appetite greatly impaired; he was still in good spirits, made no complaints excepting of debility, and looked forward to a speedy recovery.

It seems unnecessary to detail at great length the history of this case; for two months after this, it presented no peculiar features in addition to those already enumerated; all the symptoms, however, were aggravated, and the constitution began to sink under their pressure. About the middle of January 1822, the œdema had extended over his face and upper extremities, and evident marks of effusion into the chest presented themselves. He died in a few weeks with all the symptoms usually attendant on hydrothorax.

I need not detain the Society with an account of the treatment resorted to. Suffice it to say, that tonics of various sorts, iron in the form of oxide, sulphate and carbonate, mercury, opium, and astringents, were all tried; his diet was varied according to the powers of the stomach, and his bowels were duly attended to. At first, the treatment seemed to check the progress of the disease, but latterly,

the stomach and bowels became so irritable, as scarcely to admit of any medicine, and only of the mildest diet.

Assisted by Dr Kellie, I proceeded thirty-six hours after death to examine the body. Externally it presented no peculiar appearance, the colour was nearly the same as during life, and we did not observe on the depending parts of the body the usual dark coloured spots from the gravitated blood. The muscles had acquired little *roideur*. The subcutaneous fat was scanty, of a pale yellow colour, and semifluid.

Not a drop of blood escaped on dividing the scalp; the dura mater as usual was pale, presenting few vessels, and those empty; it was bedewed with serum. Near the vertex, and to the left of the sinus, was a considerable ossification imbedded in the plicæ of the membrane; it was an inch long, rough and irregular. The pia mater was pale, its blood-vessels containing a pale serum, and a considerable quantity of air; a slight effusion under the arachnoid coat. The substance of the brain was very soft and pultaceous, presenting very few vessels, and very little difference in colour existed between the cineritious and medullary portions. The ventricles contained about two drachms of serum, and about two ounces were found at the basis. The lateral sinuses were moderately filled with pale fluid blood; the arteries at the basis empty. In the thorax, we found effused about three pounds of a lemon-coloured serum; the lungs of a pale grey

colour, without any mark of gravitated blood. The pericardium contained about an ounce of serum. The heart, when cut into, was of a pale colour, and did not tinge linen when rubbed upon it; it appeared like flesh macerated many days in water. The right ventricle contained a pale coagulum. The left side was wholly empty. Coronary arteries sound. The inner coat of the aorta was of a fine red colour, for some inches without any turgescence or ossification; all the valves were sound.

There was a considerable moisture bedewing the viscera of the abdomen. The liver was of its proper size and structure, but of a light brown colour. There was no exudation of blood on cutting into its substance. The spleen was the only viscus of its usual colour; it was very soft, and its contents, on pressure being applied, turned out as from a sac. The kidneys were nearly bloodless; pancreas of a pale reddish hue. The stomach and intestines were perfectly sound, thin, showing no vessels, and transparent. The muscular substance throughout the body was, like that of the heart, very pale, and exuded no blood, but only a pale serum, when cut into. The arteries were universally empty, and so were the jugular, humoral, and femoral veins. The lower cava alone, about the bifurcation, with the exception of the lateral sinuses, contained any appreciable quantity of blood.

The only morbid appearances detected, may be considered the effusion into the thorax and abdomen, the ossification of the dura mater, and the



nearly bloodless state of every viscus and structure in the body, with the exception of the spleen.

No one will hesitate to pronounce the effusion to be merely the consequence of the previous derangement of health; but it may admit of a doubt, whether the partial change found in the structure of the dura mater had any connection with the bloodless state of the system. So little are we acquainted with the various effects which the sympathy of distant parts may occasionally produce on the healthy functions, that we cannot positively declare to what degree the assimilative process might be disturbed by the organic lesion of the cerebral membranes; yet I am inclined to think, that in this case these different states were merely coexistent.

We must, therefore, account in some other way for the exsanguine state of the body.

The various states of the sanguiferous system, as observed in dead bodies, must be familiar to every one, conversant with the appearances presented on dissection. Some of these states are too palpable to admit of any doubt; but I conceive a good criterion is still wanting, to denote the different appearances, which some refer to inflammation, others to simple congestion, and others consider merely as a *post-mortem* effect. Too little attention has been paid to this point, as, exclusive of organic lesions, it is the most frequent and important change that we find on dissection. In general, the arterial system is nearly void of blood, which is thrown upon the veins and

viscera. We often find the greater part of the system nearly exsanguine, and the great mass of the blood is thrown into the lateral sinuses, venæ cavæ, liver, spleen, and muscular texture. But a state like that of our patient's, in which every organ was nearly deprived of its red blood, is one, I believe, of very rare occurrence, and of which we have few cases on record.

A disease, under the title of Anæmia, has been described by Becker, Freytag, Janson, C. L. Hoffman, Albert Moigling, and other Continental authors whose works I have not seen.

In the *Miscellanea Curiosa* there is a case detailed by Reiselius, entitled, *Exsanguie fere Corpus*.  
 “ Propter vacua a sanguine vasa adduco Domini  
 “ Schricardi et Domini Sebastiani observationem.  
 “ 20. Octob. 1684, Michaelis Aurigæ Hospita-  
 “ larii cadaver apertum est, qui ante tres dies obiit,  
 “ sumpta prius purganti Jalap. rad. a carnifice, in fe-  
 “ bre continua ut conjicitur. In hoc corpore nec  
 “ duæ parvæ ventosæ sanguinis, nec grumi alicubi  
 “ inventi sunt. Quommodo sanguis,” concludes the  
 author “ qui neque ante neque post mortem effluxit  
 “ perierit, difficile erit pronunciare \*.”

Scwhenke has related a case of chronic illness, in which, upon dissection, the body was found nearly deprived of its red blood †.

Lieutaud was the first to give a precise account

\* *Miscell. Curios.* Dec. 2. An. 7. obs. xiv.

† Haller, *Disp.* vol. vii.

of anæmia. He seems to have met with it not unfrequently, though the correctness of some of his species may be called in question, as those after long abstinence, and profuse discharges, natural or artificial. “Ceux qui ne sont pas versés dans l’inspection cadaverique, auroit de la peine à croire jusqu’ à quel point les vaisseaux peuvent être vuides de sang : J’ai vu des cadavres dont on avoit ouvert la tête, la poitrine, et le bas ventre aussi secs que s’ils avoient été de la cire ; les moyens et les petits vaisseaux ne contenoient point de sang, le gros étoient à demi vuide : on voyoit dans les uns et les autres beaucoup d’air qui étoit sur tout très apparent dans les vaisseaux du cerveau, plus dégagés et plus diaphanés que ceux des autres parties \*.”

Professor Hallé has recorded several very interesting cases of anæmia, which occurred epidemically in one of the galleries of a mine of pit-coal, at Anzain, near Valenciennes. More than fifty had been attacked by it, and there was a striking similarity in the symptoms and appearances after death. The characteristic symptoms were the unusual loss of colour, and yellow tinge of the skin, swelling, impossibility of walking without suffocation, palpitations, and habitual sweats. In all of them the attack was preceded for several days, or weeks, by violent pains

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\* *Precis de la Médecine Pratique*, p. 72. 1761.

† *Journal de Médecine, &c. par Corvisart*, tom. ix. p. 3.  
*Edin. Med. Journal*, vol. iii. p. 170.

of the bowels, tormina, thirst, and wasting. Upon the whole, I am disposed to think, that the cause was as local as the existence of the disease, and that it was connected with some metallic impregnation (probably arsenical or leaden) of the particular gallery, and that the disease is more nearly allied to the Chlorosis rachialgica of Ramazzini and Sauvages\*, than to the Anæmia chlorosis of Lieutaud. The treatment pursued by Lieutaud and Hallé, seems the most judicious that can be adopted. Chalybeates, tonics, nourishing diet, and gentle exercise, seem to constitute the best plan of treatment, notwithstanding the little benefit they afforded our patient. Dr Young† considers it as a species of dyspepsia, and perhaps with propriety; for it is probably owing to some disorder of the digestive and assimilative organs, that its characteristic symptom has its origin, and to the correction of this derangement, we must look for a removal of the disease.

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\* Nosolog. Method. t. ii. p. 601.

† Introduction to Medical Literature.

CASE  
OF  
HYDROCEPHALUS  
WITH BIFID BRAIN,

By ANDREW DUNCAN *junior*, M. D. F. R. S. E. Professor  
of Materia Medica in the University, and President of  
the Royal College of Physicians, Edinburgh ;

WITH A  
DESCRIPTION OF THE MALFORMATION,

By the late JOHN GORDON, M. D. F. R. S. E., and Fellow  
of the Royal College of Surgeons, Edinburgh, and one  
of the Surgeons to the Royal Infirmary.

(*Read 3d July 1822.*)

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I HAVE been induced to think the case which I am about to read deserving of the notice of the Society, both on account of its extreme rarity, and as illustrating some doctrines respecting malformations in general. So far as my reading extends, no other case of bifid brain has been observed in a child which has survived birth ; and although malformations of the brain and other organs have been investigated with much acuteness and industry by several eminent anatomists, yet the subject is still so obscure,

that every new modification is deserving of being recorded, as it may tend to support or overthrow the various hypotheses advanced to account for their occurrence.

The term Bifid, which I have chosen to designate the variety of conformation which occurred in the following case, has, I find, been misunderstood; yet it appears to be perfectly appropriate, and the only one capable of expressing correctly and shortly the state of the brain, which “opened with a cleft,” as Johnson explains the term. In botany, bifid is constantly used to express the division, more or less complete, of various organs into two symmetrical parts; and even in pathology, it is employed in the appellation *Spina bifida*, and exactly in the sense in which I wish it now to be understood.

The infant was a female, and was born hydrocephalic. It lived seven months, and was occasionally seen by myself and many other medical practitioners. I am indebted to my friend Dr Beilby for the only notes preserved of the symptoms during the life of the child.

“Saw her first July 23d, then aged five months.  
 “Greatest circumference of the head  $28\frac{3}{4}$  inches;  
 “size over the crown, from the tip of one ear to  
 “the tip of the other,  $16\frac{3}{4}$  inches; length from the  
 “root of the nose to the centre of the occipital pro-  
 “tuberance 19 inches. The countenance and other  
 “parts of the body emaciated. All her functions  
 “appear to be natural. Takes no food but the

“ breast milk ; but this with the usual avidity.  
 “ On account of the weight of her head, can never  
 “ sit up ; yet she is sometimes lively, and evidently  
 “ receives pleasure from being played with. The  
 “ external senses appear to be entire.

“ July 30.—Circumference of the head 29 inches.  
 “ Length from the root of the nose to the centre of  
 “ occipital protuberance  $19\frac{1}{2}$  inches.

“ August 12.—Circumference of the head  $29\frac{1}{2}$   
 “ inches. She was crying lustily when I entered  
 “ the house. There is a considerable external sore  
 “ upon each parietal protuberance, produced by the  
 “ weight of the head resting always upon one or  
 “ other of these points. More emaciated. In other  
 “ respects as before.

“ She died October 1st, at 8 A. M.”

The head was minutely examined the day after the death of the child, in the presence of Drs Beilby and Abercrombie, Maclagan and Tweedie, Mr Turner and myself ; and when I mention that the dissection was performed by the late Dr Gordon, and the description drawn up by him, the Society will be satisfied with its accuracy in every particular, and the whole will acquire an additional interest as the posthumous production of a gentleman, who was intimately connected with most of us in the various and successive relations of pupil, fellow-student, and teacher, and whose premature loss continues to be sincerely lamented by all around me.

The following description is taken from the notes

in Dr Gordon's handwriting, without any alteration, and the figures are exact copies of his original sketches, both still in my possession.

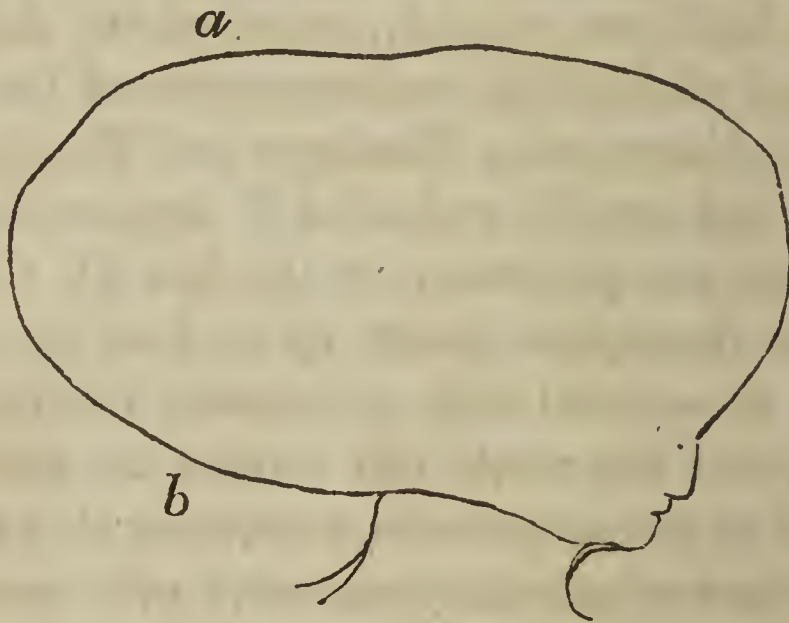
*“ Notes of the Anatomy of the Head.*

*“ I. OF THE PARIETES OF THE CRANIUM.*

*“ 1. Shape and Dimensions externally.*

*“ I measured the head, I think, in May or June.  
“ It was 29 inches round by the frontal and occi-  
“ pital protuberances, and  $16\frac{1}{2}$  over the vertex from  
“ one ear to the ear. I did not then take any out-  
“ line of its shape.*

*“ At the dissection, the form of the head was  
“ somewhat like this.*



*“ The dimensions were  $28\frac{1}{2}$  inches in its greatest  
“ circumference, and less tense than before death.*

*“ When the back part of the head behind *a b*  
“ was placed between the eye and the light, it  
“ was distinctly translucent.*



“ 2. *Parts composing the Parietes.*

“ A. *The Integuments.*—Had a thin appearance,  
 “ and were actually thinner than natural. Large  
 “ ramifications of veins were very visible in the re-  
 “ gions of the temples and occiput. There was no  
 “ appearance of granular adipose substance under the  
 “ cutis vera, such as is always to be seen in children  
 “ of the same age in a state of health.

“ B. *The Bones.*—Both halves of the frontal bone  
 “ were fully a fifth larger than they are naturally at  
 “ this age, and they were separated from each other  
 “ at the anterior superior fontanelle fully an inch and  
 “ a half; but they gradually approached each other  
 “ below, so as at last to come in contact in the usual  
 “ manner in the origin of the nasal process. Their  
 “ structure and thickness were not different from the  
 “ natural. Both parietal bones were between a fourth  
 “ and a fifth larger than they are in a full grown sub-  
 “ ject, and were as thick as in a child of six months  
 “ or rather more. Their margins were separated  
 “ from each other, and from the frontal bone about an  
 “ inch and a half. The occipital part of the occipi-  
 “ tal bone, like the frontal, was about a fifth larger  
 “ than it commonly is at this age, but was of the  
 “ usual thickness and structure, and separated from  
 “ the parietal bones by a space not less than three,  
 “ but nearer four inches. The squamous portions of  
 “ the temporal bones, and the large wings of the  
 “ sphenoid, were also larger than natural; and be-  
 “ tween their margins there were considerable inter-

“ vals, and they were more indistinct outwards than  
“ natural. But the parts of the basis of the cranium,  
“ which occupy the median plane and its vicinity,  
“ were but little affected.

“ 3. *The Dura Mater.*

“ The whole inner surface of the cranium was  
“ lined, as usual, with dura mater. It adhered  
“ closely to the bones, where they existed, and  
“ where they were deficient it was united to the  
“ inner surface of the integuments. It had the  
“ same thickness and structure as in health. Its  
“ falciform process was of the usual depth or breadth,  
“ but greatly longer. It stretched from the region  
“ of the frontal spine to the internal transverse  
“ ridge of the occipital bone as usual, and there ter-  
“ minated in the *tentorium cerebelli*. The tento-  
“ rium itself was very little enlarged or altered in  
“ its situation or appearance.

“ II. OF THE CONTENTS OF THE CRANIUM.

“ 1. *The Water.*—This was drawn off by a  
“ puncture through the most prominent point of  
“ the occiput; a blowpipe being immediately in-  
“ troduced to facilitate its discharge. By this open-  
“ ing all the water was evacuated. The quantity  
“ was 136 ounces by weight. It had the transpa-  
“ rency and want of colour which are so remarkable  
“ in this secretion, being exactly like the purest  
“ spring-water.

“ 2. *The Brain and its Membranes.*—As soon  
 “ as the whole water had been evacuated, an inci-  
 “ sion was made with a pair of scissars, first trans-  
 “ versely on the left side, from the puncture be-  
 “ tween the occipital and parietal bones, for about  
 “ two inches, and then at right angles to this, a  
 “ little to the left of the median plane, from the  
 “ puncture all the way forward to the brow.

“ When the opening in the course of this incision  
 “ had been made sufficiently large, we looked through  
 “ it into the interior of the cranium, conceiving it  
 “ possible that appearances might be advantageously  
 “ seen in that stage of the dissection, which might  
 “ afterwards become less distinct. And certainly the  
 “ aspect of parts was very striking. The brain occu-  
 “ pied the lower part of the cavity alone; the rest was  
 “ entirely empty, excepting only that the falx pro-  
 “ jected down into it, but still separated from the  
 “ brain (between the hemispheres of which it natu-  
 “ rally penetrates) nearly two inches.

“ The cavity being fully exposed, and the parts  
 “ minutely examined, the following was the result.  
 “ —Those surfaces of the two hemispheres of the  
 “ Great Brain, or Brain Proper, which are usually  
 “ applied to the falx of the dura mater, were sepa-  
 “ rated from each other for about four inches, ex-  
 “ cept within an inch of their anterior extremities,  
 “ where they remained united in the natural man-  
 “ ner. The *corpus callosum* was wholly wanting,  
 “ except two white bands, *a, a*, Fig. 1. Plate I.,  
 “ which stretched across between the anterior horns

“ of the ventricles, nearly parallel to each other,  
“ about a quarter of an inch apart, and each of them  
“ from an eighth to a quarter of an inch broad.  
“ We took these to be vestiges of this body. I en-  
“ deavoured to produce a fibrous laceration in these  
“ bands, but their softness did not admit of it. The  
“ *fornix* had also almost entirely disappeared.—Per-  
“ haps we ought to say entirely; for there remained  
“ only a round white cord, of the diameter of a crow-  
“ quill, on the right side (*b*), Fig. 1., which ran  
“ from the region of the anterior pillars of the for-  
“ nix, closely tied by means of the pia mater to the  
“ lower surface of the convolution which usually  
“ overhangs the corpus callosum, backwards towards  
“ the commencement of the hippocampus, in the  
“ inferior horn of the right lateral ventricle, where  
“ it gradually disappeared. Yet this cord had been  
“ little analogous in its structure to nervous matter:  
“ it was firm and tough, and not easily torn. The  
“ *septum lucidum* was entirely gone. There was not  
“ the slightest appearance of the anterior commis-  
“ sure of the brain remaining. The folded layers  
“ of white nervous matter anterior to the pineal  
“ gland, commonly called the Posterior Commissure,  
“ were quite distinct, and both broader and thicker  
“ than usual. The ventricles were considerably en-  
“ larged; and, from the disappearance of the corpus  
“ callosum and fornix, they formed one common ca-  
“ vity with the parietes of the cranium, and a mem-  
“ brane afterwards to be described. Had they been  
“ quite shut up, they would perhaps have contained

“ about \* of the whole fluid found  
 “ within the head. When the brain was first ex-  
 “ posed, it presented an appearance like that which  
 “ anatomists daily produce, when they divide the  
 “ corpus callosum and fornix longitudinally from  
 “ behind forwards, and allow the hemispheres to  
 “ separate from each other by their own weight.  
 “ But owing to the absence of the parts mentioned,  
 “ the surface exposed was much more extensive in  
 “ this case. Besides, the depth or breadth of that  
 “ flat surface of each hemisphere, which, in a healthy  
 “ cerebrum, is applied to the falx, and is bounded by  
 “ the corpus callosum below, was in this instance  
 “ a good deal diminished. This change had taken  
 “ place to a considerably greater extent on the left  
 “ than on the right side. See Plate I. Fig. 2.

“ Hardly any part of those convolutions and white  
 “ nervous matter on which they rest, which form  
 “ the median surface of the left posterior lobe, re-  
 “ mained. The parts looked as if the inner wall of  
 “ the posterior horn of the left lateral ventricle had  
 “ been shaved away. In consequence of this, the  
 “ surface of the inferior horn was freely exposed,  
 “ and a full view might at once be obtained of the  
 “ whole cornua of this ventricle. On the right side,  
 “ although one could, from the absence of the pos-  
 “ terior extremity of the corpus callosum and for-  
 “ nix, see almost down to the anterior extremity of

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\* Not filled up by Dr Gordon.

“ the inferior horn, without displacing the parts,  
“ yet the inner surface of the posterior lobe was not  
“ more narrowed than the portions of the hemi-  
“ sphere more anterior to it. The third ventricle  
“ was considerably widened. The flat inner or me-  
“ dian surfaces of the optic thalami were at least  
“ half an inch asunder. The cavity of the infun-  
“ dibulum was enlarged in proportion; but the  
“ aqueduct of Sylvius, or passage to the fourth ven-  
“ tricle, was of its usual dimensions. The tela cho-  
“ roidea and plexus choroides had entirely disap-  
“ peared, so that the third ventricle communicated  
“ at all points freely with the lateral ventricles and  
“ the general cavity of the cranium. The only  
“ change in the corpora striata and optic thalami,  
“ was their being less elevated than usual. The  
“ tænia semicircularis was very distinct. The col-  
“ liculus or ergot in the posterior cornu of the left  
“ hemisphere was entirely gone; the very wall from  
“ which it projects having disappeared: nor was  
“ this eminence at all perceptible in the right he-  
“ misphere. Both hippocampi remained in the in-  
“ ferior cornua; but they were broader and less ele-  
“ vated than usual. The band on each of them, called  
“ the tænia hippocampi, so remarkable in a healthy  
“ brain, was entirely wanting; and in consequence  
“ of this, the inner border of each hippocampus flow-  
“ ed gradually into the inner convolution of each  
“ middle lobe. The whole inner surface of the ven-  
“ tricles was quite smooth, and lined with an epi-  
“ thelium, preserving all the increased thickness and

“ strength which is so remarkable in every case of  
 “ hydrocephalus.

“ The thickness of white nervous matter within  
 “ the cavities of the ventricles and the basis of the  
 “ convolutions, was diminished proportionally to the  
 “ enlargement of these cavities. Opposite to the  
 “ junction of the posterior and inferior cornu of the  
 “ right lateral ventricle, it measured only a sixth of  
 “ an inch.

“ The only part where the convolutions were dis-  
 “ tinctly diminished in depth, was opposite to the  
 “ posterior horn of the left lateral ventricle. Here  
 “ they were fully one-half lower or shallower than  
 “ usual. At all other parts, they were of their  
 “ usual dimensions, and on being divided, exhibited  
 “ the usual proportion of white and brown matter.

“ All the parts in the region of the basis of the  
 “ brain were entire. The olfactory and optic nerves,  
 “ and the *motores oculorum*, could be distinctly  
 “ traced to their origin; and they presented no ap-  
 “ pearance of derangement of structure.

“ The only change which the substance of the  
 “ cerebellum had undergone, was a little flattening  
 “ of the left hemisphere, and proportional elevation  
 “ of the right; and the vermiform processes and  
 “ parts usually occupying the median plane, were  
 “ placed about an eighth of an inch to the right  
 “ of this plane. Internally, its structure was per-  
 “ fectly natural; and the fourth ventricle had un-  
 “ dergone no enlargement. All the nerves issuing  
 “ from it, viz. the trigeminal, the pathetic, the ab-

“ ductores oculorum, the facial, and the auditory  
“ pairs, were quite entire.

“ The medulla oblongata, and the nerves spring-  
“ ing from it, were in a healthy state.

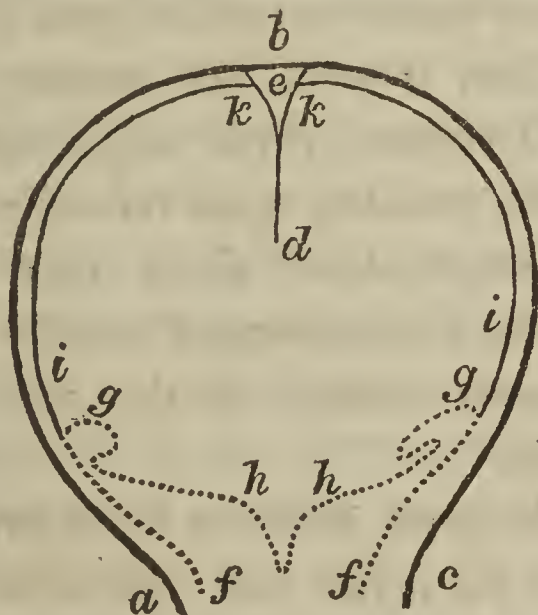
“ The pia mater presented nothing unusual. A  
“ whitish tough cord, of the diameter of a crow-  
“ quill, ran across from one hemisphere of the brain  
“ proper to another, which, on minute examination,  
“ was found to be a tube, and seemed obviously to be  
“ a branch of the *arteria corporis callosi*.

“ All the parts which were provided with pia  
“ mater, were also covered with a natural arachnoid  
“ membrane.

“ One of the most remarkable effects, however, re-  
“ sulting from the disease in this instance, was the  
“ production of a new membrane, which was interpo-  
“ sed between the dura mater and the water, over the  
“ whole extent of that part of the enlarged cavity  
“ of the cranium which was not occupied by the  
“ brain. This membrane was perfectly transparent  
“ and colourless, without any appearance of laminae  
“ or fibres, or vessels of any kind. It was soft and  
“ flexible, and about three or four times thicker  
“ than the arachnoid membrane, even where that  
“ membrane is thickest, in the region of the basis  
“ of the brain. In short, it resembled in a remark-  
“ able degree the amnion of the gravid uterus. It  
“ arose below from the whole inner and upper edge  
“ of each hemisphere, from the external border of  
“ the posterior lobe, and from the inner convolution  
“ of the middle lobe, along that line to which the



“ arachnoid membrane is affixed in the basis of the  
 “ brain ; but it was not continuous with that mem-  
 “ brane at this part. Extending upwards from  
 “ these attachments, it lined closely the whole inner  
 “ surface of the dura mater, and terminated on each  
 “ side by being attached, along its whole upper and  
 “ median border, to the root of the falciform pro-  
 “ cess, along the course of the longitudinal lines.  
 “ The following rude diagram, representing an ima-  
 “ ginary section across from ear to ear of the dura  
 “ mater, and the parts within it, will perhaps illus-  
 “ trate the connexions of this membrane.



“ The outer strong line *a b c* is a section of the  
 “ dura mater ; *b c*, a section of the falciform pro-  
 “ cess ; and *e* a section of the superior longitudinal  
 “ sinus in that process. The dotted line *f g h* re-  
 “ presents the outline of a section of each hemi-  
 “ sphere of the brain proper. The fine line *i k* re-

“ presents a section of the new membrane, issuing  
 “ from the upper edge of each hemisphere below,  
 “ and attached to each side of the root of the falx  
 “ at *k* above.



“ At its origin from the hemispheres, its root  
 “ could be easily separated into two  
 “ layers for the extent of about an  
 “ eighth of an inch, and each layer was  
 “ continuous with the arachnoid mem-  
 “ brane, crossing the convolutions thus :  
 “ Its outer surface was applied close  
 “ to the dura mater, but it was not attached to it  
 “ at a single point, except close to the falx above ;  
 “ so that it was quite moveable upon it, and could  
 “ be raised from it with the utmost ease. To-  
 “ wards the fore-part, three large venous trunks  
 “ could be seen running upon its inner surface to-  
 “ wards the longitudinal sinus, into which they  
 “ opened. These corresponded exactly to the large  
 “ anterior venous vessels of the pia mater in a  
 “ healthy brain.

“ The whole great brain, or brain proper, weigh-  
 “ ed, with the pia mater and arachnoid membrane,  
 “  $16\frac{3}{4}$  ounces.

“ The right hemisphere weighed  $8\frac{1}{2}$  ounces, the  
 “ left  $8\frac{1}{4}$ , or  $\frac{1}{4}$  ounce less than the right.

“ The weight of the whole cerebellum, with its  
 “ membranes, and the medulla oblongata attached  
 “ to it, was  $2\frac{1}{2}$  ounces ; so that the weight of the  
 “ whole brain was  $19\frac{1}{4}$  ounces.”

The state of the parts discovered to exist in this case suggests various subjects for consideration.

The case occurred soon after Dr Gordon and Dr Spurzheim had published their respective opinions regarding the pathological state of the brain in chronic hydrocephalus, and we proceeded to the examination with the greatest anxiety, fully expecting that the facts would bear decidedly upon the chief point at issue, whether the brain was merely distended and unfolded, as maintained by Spurzheim, or, whether the enlargement of the ventricles was owing to interstitial absorption, according to the opinion of Dr Gordon. We never doubted that the water would be found within the ventricles. But in this respect we were completely disappointed, for there was neither absorption of the brain nor distension of the ventricles. The whole brain, cerebrum and cerebellum, weighed 8040 grains, of which the cerebellum was 1200, leaving 6840 for the brain proper, independently of the dura mater, and what Dr Gordon has called the new membrane, but which I am disposed to consider as the arachnoid coat thickened.

I regret that I have not been able to ascertain the average weight of the brain and cerebellum in infants of seven months of age, or even to find in authors a single instance where the weight of a brain of that age is stated. But the brothers Wenzel have given a table of the weight of brains at different ages of the fœtus, and of the human sub-

ject after birth, and I shall extract those which are nearest to our case\*.

They state, that the whole brain of a female child, at birth, weighed 6150 grains,—the brain 5700, and the cerebellum 450. Now, by comparing these with our case, we find that the whole had acquired in weight, during the seven months after birth, 1890 grains; but the increase of the different portions was very unequal, the brain had gained 1140, and the cerebellum 750, which is a much larger proportion. Of a female child, examined by Wenzel at birth, the weight of the brain to that of the cerebellum was as  $12\frac{2}{3}$  to 1; in our example it was at seven months as  $5\frac{7}{10}$  to 1. Although this change of proportion be excessive, it always takes place, though in a less degree, during the first years of the life of the infant. Thus, the next age examined by the Wenzels is three years, and of this age he gives the proportions in a boy and in a girl, in whom they were nearly alike, although the absolute weight of the parts was greater in the girl than in the boy. The weight of the brain in the girl was 13,380 grains, and of the cerebellum 1850, or as  $7\frac{6}{11}$  to 1; therefore, the cerebellum in the perfect child also increases in a greater proportion than the brain.

The same fact may be stated in another way. In

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\* Josephus et Carolus Wenzel, De penitiori Structura Cerebri Hominis et Brutorum. Folio, Tubingæ 1812. Tabula tertia.

the examples given by Wenzel the proportionate increase from birth to three years of age, and in one case from birth to seven months, was from 1 to

	Brain.	Cerebel.	Both.
Girl, 3 years,	2.33	4.1	2.48
Boy, do.	2.	3.46	2.1
Girl, 7 months,	1.2	2.66	1.3

It is to be regretted that the Wenzels have given no facts as to the increase of the parts of the brain of infants under three years of age, for from their table it is evident, that the greatest absolute increase, and the greatest change in the proportions which the cerebellum bears to the brain proper, take place during the first four years of life, perhaps during the first year. This defect in our knowledge of the development of the brain, and its various parts, may be easily supplied by those who have opportunities.

In this case, therefore, there was not only no probable absorption of the substance of the brain, but there was no distension of the cavity of the ventricles, and no dilatation of the hemispheres; so that the case did not at all bear upon the point at issue between Dr Gordon and Dr Spurzheim, except in so far as it proved that the power by which the fluid was effused, and which was capable of distending the dura mater, skull and its integuments, so as to contain nine times its natural volume of contents, did not cause any appreciable absorption of the cerebral substance.

Nosologists speak of internal and external hydrocephalus, according as the water is contained in the ventricles of the brain, or between the brain and some of its membranes. But our case cannot be properly referred to either.

The water was in contact with the inner surface of the lateral and third ventricles, and was nowhere interposed between the external surface, or convolutions, of the hemispheres, and the membranes, and so far it agreed with hydrocephalus internus; but, on the other hand, it was in direct contact with the membranes, through at least three-fourths of their extent, thus corresponding more than any case I have seen with external hydrocephalus, excluding from this denomination the effusion of a small quantity of serum upon the surface of the brain, which frequently occurs.

Indeed, I have very great doubts of the existence of external hydrocephalus, and am inclined to ascribe the instances of it quoted to inaccurate observation. In many cases of chronic internal hydrocephalus the ventricles are so much distended, and the parietes so much thinned, that the head becomes translucent as a hydrocele, and the hemispheres form a mere membranous bag, which has often been, and indeed generally is ruptured in attempting to open such heads. The water is then sometimes supposed to lie in direct contact with the membranes, and between them and the brain; the remaining parts of the basis of which are believed to be the whole brain, compressed by the water ex-

ternal to it, while the thinned upper portions of the hemispheres are altogether overlooked, or supposed to be a false membrane, or exudation of coagulable lymph.

Mr Loftie has described a case \*, which, he says, “differed not only in the outward appearance from common *hydrocephali*, but especially in this circumstance, that the water was contained between the *dura* and *pia mater*, not in the ventricles, or within the substance of the brain;” but, I must confess, that the description given has not satisfied me that Mr Loftie has taken a correct view of his case. It was in many respects unusual. The child was born hydrocephalic, and was about seventeen months old at the time of his death. The disease appeared in the form of a tumour, on the vertex of the head, very different in shape from the common hydrocephalic heads. The circumference of the head was 20 inches, of the tumor, at its base,  $16\frac{1}{4}$ , at the middle  $18\frac{1}{2}$ , and its length, from the base to the apex,  $8\frac{1}{2}$ . Some days before death five pints of uncoagulable limpid fluid were drawn off by a small trocar, and two days afterwards, “as there was evidently more fluid under the integuments,” an opening was made through the scalp, about an inch in length, and two pints of serum let out. The finger was passed through the opening into the

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\* The case of Henry Steed; by Mr Loftie, Surgeon, Canterbury. See *Medical Observations and Inquiries*, vol. v. p. 121. 8vo. London 1776.

cranium, and nothing of the cerebrum, &c. could be felt. It appeared from the dissection, that the puncture and incision had been made through the *dura mater*, and if the brain had been distended and attenuated, as in the ordinary hydrocephalus, it is almost certain that they penetrated into the ventricles, when their vaulted roof would probably collapse, especially as no water seems to have been found in the head after death. From some parts of the description, however, it may be thought that the case was somewhat analogous to that we are describing. “ On dividing the integuments in a line, “ from the frontal suture to the apex of the tumor, “ we found that they were lined internally with the “ *dura mater*, not materially altered, except that “ the falciform process was totally obliterated. The “ two hemispheres of the brain, down to the corpus “ callosum, were separated far asunder, and pressed “ on all sides against the bones of the skull, exhibiting to our view the form of an irregular capacious bason, in which this great quantity of water “ had been contained. The two anterior lobes of “ the brain were pressed forwards and upwards, beyond the *os frontis*, making, by a sort of duplication on themselves, a kind of semilunar cover to “ about one-fourth of the bason, and adhering on “ their convex side to the bones of the forehead. “ It was easy to reduce the brain to its natural situation, and, on examining its texture, the cortical “ substance appeared sound, and covered by its pia



“ mater; the medullary much condensed by the  
 “ weight of the superincumbent fluid, the cerebel-  
 “ lum, medulla oblongata, and nerves of the head,  
 “ shewed no signs of being affected. Near the oc-  
 “ ciput was a small hole through the skull, covered  
 “ with a thin membrane only.”

It is with much diffidence that I venture to differ in opinion on any pathological point from the late Dr Gordon, yet I cannot agree with him in considering the membrane found immediately within the dura mater as a new membrane. Regarding it in this light, it must either have been an original supernumerary preternatural membrane, or a morbid formation.

The latter supposition is not admissible, for not only was its texture much too uniform through so great an extent, to have been the production of disease, but every morbid or false membrane is originally formed by the effusion of coagulable lymph, which afterwards becomes organized, by vessels shooting into it from the natural membrane, on whose surface it was effused. In this case, however, the morbid and natural membranes are necessarily intimately connected, and cannot be separated, without the laceration of numerous vessels; whereas, in our case, the dura mater, and the membrane within it were in mere contact, without any adhesion, just as the dura mater and arachnoid membranes are in the natural state of the parts; and it must, therefore, have been nourished by pellucid vessels derived from the basis of the brain, and ra-

mifying over that large expanse of it which lined the dura mater, and was in direct contact with the water. Another irrefragable proof of its being an original membrane, was, that it returned its blood by two or three visible veins, into the superior longitudinal sinus, whereas the blood of a new membrane is returned by short veins directly into the old membrane by which it was formed.

The other supposition, that it was an original preternatural membrane, is equally improbable; for, as far as my knowledge of pathology goes, I know no instance of any thing similar. There are no doubt, numerous examples of redundant or supernumerary parts, but they are always a repetition of whole organs or portions of an organ, such as additional toes or fingers, additional limbs, trunks or head, double or triple urinary bladder, or at times three testicles, &c. but I have never read of any thing at all resembling an additional membrane in any organ or part of the body.

I am, therefore, inclined to consider the membrane, whose nature we are now considering, to be what its situation in immediate contact with the dura mater, and not connected with it, would indicate it to be; the arachnoid coat distended and morbidly thickened, as is often observed when serous membranes are the source of dropsical effusions. Also, although Dr Gordon in one part of his description, says, that it was not continuous with the arachnoid membrane at its origin, where it runs along that line to which the arachnoid

membrane is affixed in the basis of the brain, yet in another place, he distinctly states it as splitting into laminae continuous with the arachnoid coat, covering the convolutions, and he even made the sketch of the fissure, already exhibited.

The origin of malformations presents an interesting subject of speculation; and the first inquiry that suggests itself in regard to the present case, is, at what period of the formation or growth of the embryo, the deviation from the common structure was established? Two suppositions may be made. It either may have existed from the very first organization of the embryo, or it may have taken place in consequence of some interference with the natural progress of the embryo to its perfect state. The effect of the first cause in modifying the structure of the foetus must remain for ever unknown, or at least, until the whole mystery of generation be understood; and as, upon the second supposition, which furnishes matter of pure observation, many of the most common malformations can be readily explained, we are inclined to attempt its application in every case, and to revert to the first only, when we are compelled to confess that it altogether surpasses our comprehension.

In the instance before us, for example, we may suppose either that, from the very first, or from the moment of impregnation, the bifid brain, such as it was observed, was so constructed, different from all other brains of the human species; or that it was at first formed like other brains, but that its de-

velopment was rendered irregular by some foreign agency. As I have already said, the latter supposition is more consistent with those general laws which regulate the phenomena of animate and inanimate bodies.

The malformation to be accounted for in the present case is, that the *corpus callosum* and *septum lucidum* were wanting, or divided longitudinally, and their halves laid at a distance from each other, and that the ventricles were not closed but open, and freely exposed on their mesial surface.

Two hypotheses occur to me, by which this state of the parts may be explained, consistently with the supposition, that the original formation of the embryo was natural, but afterwards disturbed or affected.

We may suppose, that the brain was once a natural and entire brain, but that, in consequence of the accumulation of water within the ventricles, at an early period of the foetus, when the brain was very tender, the corpus callosum gave way, while the tougher membranes resisted. The natural consequence would be, that the hemispheres would be separated and retained on the lower part, by their being bound down by vessels and nerves to the bones forming the basis of the skull, while the membranes, bones and integuments, would continue to enlarge, as the quantity of effused water increased.

But this supposition is improbable, both from the fact, that the upper edges of the cerebral mass

were in no degree attenuated, as would have been the case previous to their rupture from distension; but on the contrary, were rather turbinated and involuted; and also because it is exceedingly improbable that the brain could be ruptured, while uniformly supported by the dura mater, as, indeed, we may say is almost proved, by the instances we often see of extreme extenuation of the hemispheres in ordinary cases of chronic hydrocephalus, without rupture ever taking place.

I am also the more disposed to reject this hypothesis, because many years ago\*, I advanced one very similar, to account for a malformation of the urinary organs, which Meckel has done me the honour to examine at some length, in his *Manual of Pathological Anatomy* †, and has combated by arguments and facts, which have completely satisfied me that my former opinion was quite erroneous, and that the totally different explanation of the malformation of the urinary organs alluded to, which he has given, is the true one, and one that may be extended to the bifid brain, although no case of it seems to have been known to Meckel.

Meckel's hypothesis is, that the formation of the parts of the embryo or foetus is progressive; that, in

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\* Edinburgh Medical and Surgical Journal, vol. i. p. 43. and 132.—1805.

† Handbuch der pathologischen Anatomie von Johann Friedrich Meckel, Professor der Anatomie zu Halle, 8vo. Leipzig 1812, vol. i. p. 730.

many instances of malformation, the embryo was originally well formed, but that, in consequence of deficiency of those powers, by which the gradual development of parts, and progress of organization towards the completion of a perfect infant, or even of an adult, takes place, this development or progress is at a certain period arrested in the part where the malformation occurs, which part, therefore, continues until birth, or through life, in the embryo state, or in that condition which it had reached when the progress of its development was arrested. Thus, it is natural for the *foramen ovale* of the heart to close soon after birth, because it is no longer necessary. But it occasionally remains open through life, and the communication between the auricles in this instance, is not the effect of any original imperfect formation of the embryo, and still less is it the consequence of any power or force rupturing the septum after it was perfect, but is simply owing to the orifice not closing up, as is commonly the case, but remaining in its foetal state. Similar interruptions to the progress of the foetus towards maturity, may take place at any period after conception. In the first period, when the embryo is a mere atom of mucus scarcely coagulated, and for some time after, there are no organs. These are afterwards formed at different times. When the degree of formative energy is deficient, some organs are not formed at all, whose absence at an earlier period is the natural state. Hence, the want of such an organ, is the effect of

the development and formation of the fœtus remaining stationary, so far as regards that organ.

One of the most interesting circumstances regarding the progressive formation of the fœtus, and which has a great share in explaining the malformations commonly observed, and, if I mistake not, explains the case which has led to these observations, is the formation of the fœtus of two lateral halves, which at first are quite unconnected. When the development of the organization is regularly progressive, these distinct halves soon unite perfectly, but when their union is partially interrupted, a variety of malformations is generated, which are often manifested by the exposure of organs that ought to have become covered.

As examples may be quoted, all fissures of the anterior and posterior surfaces of the body, the exposure of the organs of the chest or abdomen, of the spinal marrow or brain, hare lip, fissure of the palate, exposure and fissure of the urinary bladder, separation of the ossa pubis, double uterus, vagina, &c. A detail of these would fully establish Meckel's opinion, but it is necessary, that I should confine myself to the illustration of the present case, and to those circumstances which bear directly upon it.

Meckel (p. 260.) thinks, that in most, if not in all cases of congenital hydrocephalus, the disease is owing to an arrestment of the progress of organization of the skull and brain.

This opinion chiefly rests upon the form of the

brain, the state of the bones, and the form of the head in general. Also, the disease seems always to be congenital, and to occur under circumstances which are calculated to interrupt development, and it is often accompanied with other malformations, depending upon the imperfect union of the halves of the foetus.

Morbid disorganization, the effect of disease, is an extremely rare occurrence in the foetus. Meckel saw nothing like it, in nearly one hundred which he opened to ascertain this point. If, therefore, congenital hydrocephalus arose from disease, it would be a singular exception, especially as other dropsies are very infrequent in the foetus. But congenital hydrocephalus is not uncommon. Osiander of Gottingen, observed hydrocephalus in a series of foetuses, from the second month after impregnation until the period of maturity; and the late Dr Monro remarked, that although hydrocephalus was not recognised in some children until after they were two years old, the bones of the skull were uncommonly separated before this time, and during the whole life of such children,—supporting the inference that it was congenital.

For the elucidation of the present case, it is in the next place important to shew, that, in an early stage of the growth of the foetus, the ventricles of the brain are not closed, and that they resemble remarkably the state of the hemispheres in the head we examined. For this purpose, the following quotations from Tiedemann's admirable Ana-



tomy and History of the Formation of the Brain in the Fœtus \*, will be sufficient ; and it is impossible not to be struck with the resemblance of the state of the parts described by Tiedemann, with those observed in the present case. As part of the description of the brain of an embryo of the twelfth week, he says, “ The hemispheres of the brain are  
 “ uncommonly small, in proportion to the parts al-  
 “ ready described, (the *cerebellum*, and especially  
 “ the *corpora quadrigemina*), for they are only  
 “ four lines long, five broad, and three high. Pro-  
 “ perly speaking, only their anterior lobes are as yet  
 “ formed; for the middle and posterior lobes present  
 “ only two very short appendices, rounded poste-  
 “ riorly, and lying before and to the side of the  
 “ *crura cerebri*. From this scanty formation of  
 “ the hemispheres, it will be understood, how parts  
 “ which, in the adult brain, are covered by the  
 “ brain, lie here exposed and uncovered, such as  
 “ the *corpora quadrigemina* and *cerebellum*.  
 “ The surface of the hemispheres is every where  
 “ smooth, and shews no *sulci* or convolutions.  
 “ The two hemispheres are on the upper side deep-  
 “ ly divided longitudinally, and into the fissure,  
 “ the falciform process of the dura mater enters,  
 “ which as yet is tender, and projects little.

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\* Anatomie und Bildingsgeschichte des Gehirns im Fœtus des Menschen, nebst einer vergleichenden Darstellung der Hirnbaues in den Thieren : von Dr Friedrich Tiedemann, Professor der Anatomie an der Universitat zu Lundshut, 4to, Nurnberg 1816. See page 20.

“ When the two hemispheres are separated laterally from each other, we observe at once the *thalami optici* and *corpora striata*, for as yet there is no *corpus callosum* and no *fornix* formed. The two hemispheres are connected only anteriorly, constituting the first commencement of the *corpus callosum*. The hemispheres are evidently two hollow membranous bags, whose parietes are scarcely  $\frac{1}{4}$  line thick. If we continue cautiously their separation, we can turn them entirely sideways, and unfold them into a membrane, so that the cavities of the ventricle and the eminences in them are exposed.” (See fig. 3. Plate I.)

After describing the progress in the formation of the hemispheres, until the maturity of the infant, Tiedemann thus concludes. “ From all this, it appears, that the formation of the hemispheres proceeds from the sides and from before; that they were originally a thin medullary membrane, turned inwards and backwards; that they gradually increase in size and thickness, and that in the same proportion they stretch from before backwards over the *corpora striata*, the *thalami*, the *corpora quadrigemina*, and lastly over the cerebellum, and cover these parts\*.”

The corpus callosum does not exist in the brain of the human embryo, during the first months after conception. It is towards the end of the third

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\* Tiedemann, p. 143.

month, that the two membranous hemispheres are first connected anteriorly by a small, narrow, almost perpendicular commissure; while in the middle and posteriorly, they are so entirely distinct from each other, that the thalami and third ventricle are seen when they are drawn aside. In the fourth and fifth month, it is still very thin, and has an almost perpendicular situation. In the sixth month, when the hemispheres have extended considerably backwards, the *corpus callosum* has turned backwards, and assumed a horizontal position, and covered the anterior part of the *thalami*. In the seventh month, it lies perfectly horizontal, and covers the *thalami* and third ventricle. In the eighth, it not only covers the *thalami* perfectly, but stretches to the *corpora quadrigemina* \*.

As to the ventricles his conclusion is: “ In the  
 “ embryo of the second month, when the hemis-  
 “ pheres are only a thin membrane, reflected from  
 “ before, and from the sides, backwards and inwards,  
 “ scarcely covering the *corpora striata*, the lateral  
 “ ventricles are very small, and comprehend only  
 “ the space lying between the *corpora striata* and  
 “ the reflected membrane. At the end of the third  
 “ month they have considerably increased in size.”

But it is unnecessary for my present purpose to trace the progress of the various parts of the brain further. Enough has been brought forward to shew, that the state of the malformed parts in the singu-

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\* Tiedemann, p. 156.

lar case that occurred to us, corresponded very exactly with their natural state in a foetus in the third month ; that is, the inner edges of the parietes of the hemispheres were connected at the fore-part only by a very short and incomplete *corpus callosum*, and the ventricles were quite patulous. Till about this period, I therefore suppose, that the formation of this child had been regular, when, in consequence of a want of that plastic power by which the *corpus callosum* grows, and the ventricles are closed, its progress towards the perfect state was arrested, and it remained in the foetal condition, as to form, but continued to grow in size.

Whether a hydropic action of the serous membranes of the brain was the cause of the arrested progress of its development, or whether the unnatural arrangement was the cause of the increased serous effusion, cannot be easily decided ; but after the dropsy became considerable, in such a state of the parts, the effect would naturally be to expand and distend the skull and membranes lining it, while the hemispheres, attached by nerves and vessels to the basis of the skull, and to the cerebellum and medulla oblongata, would be confined to the lower part, and be thrown outwards, along with the temporal bones, which, by distension, were rendered almost horizontal, so as to give the appearance represented by Tiedemann, when the hemispherical membranes of the early foetus were artificially separated.

*Explanation of Plate I.*

Fig. 1. is an exact copy of Dr Gordon's original sketch of the manner in which the hemispheres of the brain were united anteriorly, as described in page 211. The parts are represented of their natural size.

Fig. 2. represents the size and figure of the open internal surface of the right lateral ventricle covered with epithelium; *a* anterior cornu, *b* posterior cornu.

Fig. 3. is copied from Tiedemann, Plate I. fig. 8., and exhibits the brain of a foetus in the third month, with the hemispheres separated, to shew the open ventricles.

Fig. 4. is also copied from Tiedemann, Plate IV. fig. 4. It represents the form of the floor of right lateral ventricle in a foetus of twenty-one weeks, as exposed by a horizontal section. It is introduced to shew the general similarity of form to that of the right ventricle in the present case, fig. 2.

CASE  
OF  
PHRENITIS  
WITH  
GREAT CEREBRAL CONGESTION,  
SUCCESSFULLY TREATED, IN INDIA, BY OPENING  
THE RADIAL ARTERY.

By J. P. RHIND, Esq. Surgeon of Cavalry, in the Service  
of the Honourable East India Company.

Communicated by Dr BARCLAY.

*(Read 8th January 1823.)*

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AT midnight between the 7th and 8th of May 1820, I was called to see De Sanza, my native assistant, who was reported to have been taken suddenly and dangerously ill. On reaching his tent, I found him in a low muttering delirium; his pulse quick, hard, and small; his eyes much dilated and inflamed. He would sometimes lie perfectly quiet for a few seconds, breathing laboriously, as if he had just finished some violent exertion; then all of a sudden he would start up, and vociferously call upon those around, unconscious of their presence; then mutter prayers, &c. incoherently, and again, apparently from exhaustion, become perfectly still.

His servant could give no satisfactory account of the manner he was taken ill, or how he had been occupied during the evening; and from his character of uncommon temperance, I was unwilling to attribute these symptoms to inebriation, for I had not once known him to exceed in the use of wine or spirits since he entered my service. Still, however, a most violent determination to the head seemed unquestionably to have been produced by some means or other; and whatever that might be, an evacuation of blood was decidedly indicated.

With the intention of removing this symptom, I immediately sent for my lancets, but his pulse sank so rapidly, that before I had time to open a vein of the arm, it could not be felt at the wrist, and not one drop of blood would flow: nor were my attempts with the jugular more successful. I now, without the smallest loss of time, divided the temporal artery, in which a very feeble pulsation could still be felt. From it a very small stream flowed; and that there might be as sudden a depletion as possible, I also divided the corresponding artery of the opposite side; but even this was insufficient to arrest the rapid progress of the disease, and before four ounces could be abstracted, it entirely ceased. His extremities became cold, and neither was his breathing nor the pulsation of his heart perceivable. He was to all appearance dead; so much so that the attendants had already begun to close his eyes and stretch his limbs, when happening to observe a case of scalpels upon the table, the thought suddenly

struck me, that, as one last and only hope, I would try the effect of opening the radial artery. I immediately snatched up one of the scalpels, cut down upon the artery, and upon its being laid fairly bare, made a small puncture in it with the point of a lancet. A few drops only of blood oozed from the wound; presently, however, it came in a small uninterrupted stream, as from a vein, and nearly of as dark a colour; the stream gradually enlarged, till at length the arteries recovering their natural impetus, the blood was propelled per saltum, and at the same instant the poor fellow opened those eyes which every one present supposed had been closed for ever. For the purpose of finding whether he had also regained the power of speech, I asked him how he felt, and shall never forget the ecstasy with which I heard him reply (after heaving a deep sigh), "I think I'm better, sir."

The flow of blood was now stopped by putting my thumb upon the wound, lest the too sudden depletion should cause syncope, and after about half a minute again allowed to flow; and this was repeated until about twenty-four ounces were abstracted. The wound was now well cleaned with a sponge and water, the lips carefully brought together, a graduated compress applied, and secured by a double-headed roller. By this time his senses were completely restored, and he made no complaint whatever, but of severe exhaustion: as a measure of precaution, however, I had his head shaved, and



a large blister applied. He was now put to bed, and several of my most intelligent servants ordered, by relieving each other by turns, to keep watch during the whole night, and to call me immediately, should the smallest change appear.

Towards morning, one of the men came to inform me, that De Sanza had suffered a relapse; and I found him muttering to himself; but the symptoms were by no means so violent as they had been the preceding night; and they were soon subdued by removing the compress and bandage from the wrist, and suffering about twelve ounces of blood to flow from the yet unclosed artery. Small repeated doses of a saline purgative, conjoined with nauseating doses of tartrate of antimony, were then ordered to be given during the day. He slept well that night; and thenceforth the cure went on without the smallest interruption; so that, at the end of six days, he earnestly desired to resume his duty. To this, however, I would not consent, apprehending that exposure to the sun at so hot a season of the year, might at least retard the cure, if not occasion a relapse. But at the end of ten days, he returned to his duty, and had not another symptom from that day till a month after, when he was attacked with gastritis (then epidemic in India, and generally, although erroneously, termed Cholera Morbus), which, notwithstanding my utmost exertions, proved fatal in two days; and I was thus deprived of one of the most useful of assistants and faithful of servants.

Thus, my dear Sir, I have transcribed the case as the few notes by me have permitted; but regret exceedingly, now that you deem them interesting, that I did not retain a few more particulars; yet trust that nothing very essential in the symptoms or cure have been omitted.

CASE  
OF  
D Y S P H A G I A,

WITH

ABSCESS INVOLVING THE ŒSOPHAGUS, TRACHEA,  
AND LUNGS.

By DAVID HAY, M. D. Fellow of the Royal College  
of Surgeons.

*(Read 8th January 1823.)*

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A GENTLEMAN, fifty-four years of age, who had generally enjoyed good health, and was remarkably robust, in December 1821, began to suffer from symptoms of indigestion, loss of appetite, flatulence, heartburn, uneasiness, or dull pain, after eating, disposition to spit a frothy mucus, attended by a costive state of the bowels, and furred tongue.

In January 1822, he described a feeling of obstruction in swallowing his food, as if there were some kind of barrier which opposed its passage into the stomach: this he attributed to flatulence, as he always felt relief when he was able to bring up wind by eructation, and then he perceived that the food passed into the stomach. In February, March,

and April, these symptoms did not distress him much, and he was able to attend to his ordinary occupation with little inconvenience. In May, however, they became more severe, the obstruction to the passing of some articles of food being greater than to that of others; he felt that pills frequently stuck about the orifice of the stomach, occasioning considerable pain, and he was forced to swallow quantities of water before they were made to pass into the stomach.

About this time he began to complain of considerable uneasiness across the upper part of the right breast, under the pectoral muscle, and extending towards the axilla. He sometimes was sick, and brought up a quantity of ropy mucus from the gullet: he had no pain in the region of the liver, or at the top of the clavicle.

A probang was passed into the stomach with perfect facility, but he felt an increase of pain at the pit of the stomach, and in the right breast, for an hour or two after this examination. On the 8th of July he went to Dunblane for the benefit of the country air, and with the intention of using the water. He remained there upwards of a fortnight, drinking the water daily, but without advantage; on the contrary, when he returned home, on the 24th, he seemed to have lost both flesh and strength; his complexion had become sallow, and his pulse, which previously was natural, had become more frequent, and his bowels were constipated, the use of the water having failed to keep them regular.

On the 1st of August he was more than usually fatigued by business, and during the night he was attacked with febrile symptoms, attended with severe pain in the upper part of the right breast, and shooting to the back; his pulse beat 100, and full, but he had no cough; he was freely bled, a blister applied, and a regimen strictly antiphlogistic enjoined. About the 6th he began to cough, particularly when he took any food, but seldom at other times during the day; during the night the cough was more troublesome, and he expectorated a small quantity of frothy mucus. From this time to the 24th he did not suffer much, and seemed rather to improve than otherwise; but he then had a shivering fit, followed by fever; the pain of the right side again increased, the swallowing at times was very difficult, and his cough distressing.

On the 26th there was complete obstruction in the gullet, not an article of solid or liquid food could be passed into the stomach; the cough was very severe, and his pulse 112, and strong. None of the remedies employed giving relief, an elastic gum-tube was passed into the œsophagus; but it was stopped when opposite to the upper part of the sternum. A common elastic gum catheter was substituted, which went down beyond this point without much difficulty; but when a small quantity of beef-tea was thrown into the tube, it was instantly forced back, threatening suffocation, and inducing violent coughing. During the night he recovered the power of swallowing, and he was enabled to get

over, without difficulty, a pint of chocolate, for which he had a strong desire. The cough, however, continued to harass him when he took any liquid, and he now expectorated, in large quantities, a sero-purulent fluid, having a most offensive smell, mixed with the drink he attempted to swallow.

During the 28th he was sometimes able to swallow, at other times not: he took beef-tea and chocolate as he felt inclined, but little seemed to reach the stomach. In the evening the purulent expectoration continued, and a portion of slough was discharged along with it. Pulse 96, surface hot and dry.

From this time to the 1st of September, when his sufferings terminated, there was no material alteration in his symptoms. His weakness increased rapidly, his fever remained unabated, his tongue was foul and parched, the purulent expectoration diminished, but he was distressed with sickness and retching (nothing, however, being brought up); and he passed several stools, consisting chiefly of matter similar to that which he before coughed, or hawked up.

During the last twenty-four hours of his existence he was able to get over nourishment as easily as he had done from the commencement of the obstruction; even brandy and water passed without exciting cough. He retained his mental faculties to the last.

*Dissection.*—The cartilages of the ribs were generally ossified. The lungs, in both cavities of the

pleura, on their anterior surface, presented a healthy appearance; they adhered towards their posterior surface slightly on the left side, but more firmly on the right, especially towards the upper part; the left cavity of the pleura contained a small quantity of serum.

In taking out the lungs from their situation, the more easily to examine the state of the œsophagus, and parts within the posterior mediastinum, a large abscess was discovered in the upper and posterior part of the right lung, comprehending as portions of its parietes the œsophagus and trachea. The œsophagus was destroyed by ulceration to the extent of half its circumference, upwards of four inches of its length. An opening had taken place in the trachea, extending from an inch above its bifurcation, to half an inch below it, communicating with its right branch; the portion of the lung in which the abscess had formed was condensed in its structure; the inner surface of the abscess was foul and sloughy.

Tracing the œsophagus downwards from the lower part of the abscess, its external surface seemed in general sound; but on opening it, a line of tubercles somewhat larger than split peas, and of a firm texture, was seen lying immediately behind or in the substance of the mucous membrane, which in some points was slightly abraded or ulcerated. This line of tubercles led to a larger one nearly of the size of an almond, and placed on the exterior surface of the œsophagus, near the cardia.

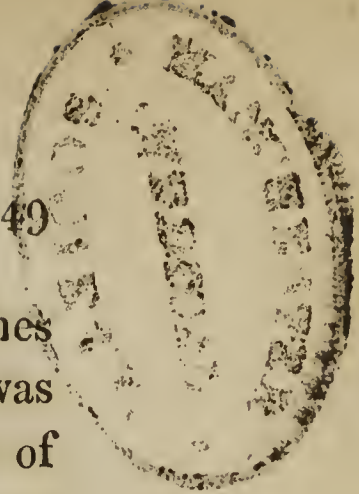
When the diaphragm was divided, for the purpose of examining the termination of the œsophagus in the cardia, a considerable hardness was felt; and, on further examination, an irregular hard mass, consisting of enlarged lymphatic glands, was exposed. This mass, from its situation in the angle betwixt the œsophagus and stomach, must have compressed the opening into the latter; the finger could be passed freely from the stomach through the cardia; but, although the tumor was found to press on one side, it offered little or no resistance to a probang in passing into the stomach.

The stomach itself was perfectly sound, as well as the other abdominal viscera.

*Observations.*—The symptoms of this case at first seemed to be those of indigestion, unconnected with organic disease; but the accession of dysphagia indicated that the complaint was of a more serious nature. The obstruction to the passage of food, however, being occasional, and appearing to be excited or aggravated by the irregular state of the bowels, encouraged the idea of its being of a spasmodic nature; at the same time, the pain at the pit of the stomach, and the description of the feelings of the patient, opposed this opinion.

The treatment employed was regulated according to the symptoms and progress of the complaint. Laxatives, particularly aloetic powders and pills, always gave relief. The combination of aloes with assafœtida, was useful in promoting the dis-





charge of flatus; alkaline and absorbent medicines afforded relief to the heartburn, with which he was frequently tormented: he also took the infusion of gentian, colombo, and other bitters. In February, March and April, there was an abatement in the severity of his complaint. In May, however, as the obstruction at the bottom of the gullet was more complete and frequent than formerly, a probang, with an ivory ball, was passed into the stomach, which met with no obstruction, but occasioned pain in the cardia and vicinity. Blisters and sinapisms were at this period frequently had recourse to, as they seemed to relieve the pain at the pit of the stomach, and to remove the spasmodic obstruction. As this patient had lived fully, and as there were some symptoms present, which might be supposed to arise from disease of the liver, he was put under a course of mercury, which was continued for five or six weeks, without benefit. In June, he was visited by Dr Hamilton *senior*, who recommended a continuance of the aloetic laxatives, a course of the super-carbonate of potash with colombo, and that he should go to the country, or try the effects of a watering-place. In compliance with this advice, he went to Dunblane; but returned without having derived any advantage.

The pain of the stomach suggested the trial of opiates, which were withheld as they increased the constipated state of his bowels, and also produced distressing headache. The hyosciamus, in large doses, for one or two nights, gave relief; but soon

lost its power. About the end of July, he was visited by Dr Thomson, who attended him along with me till he died. In consequence of the obstruction to the passing of more solid food into the stomach, he was compelled to live on slops almost entirely; such as beef-tea, chicken-broth, rice, sago, and arrow-root, with the addition of milk.

When the attack of pain in his breast came on, the animal broths were withdrawn; the blister which succeeded the bleedings was kept open as an issue; and to relieve the cough, a mucilaginous mixture with laudanum was prescribed.

On the 26th of August, when the obstruction in the gullet became complete, and was attended with a high degree of fever, the bleeding was repeated to about eight ounces. By this, he was relieved in some degree from the feverish symptoms, but in no other respect. This measure was resorted to from the benefit he had experienced from it before; and also in the hope that it might tend to remove spasm or inflammation, if the obstruction depended on either of them.

As it was impossible to introduce any liquid into the stomach, he was ordered an injection of  $\zeta$ iv. of strong beef-tea every four hours, with a full doze of laudanum in the one given at bed-time. These he continued to receive till the morning of the 1st of September, when it appeared improper to disturb him. They were retained even without laudanum, and seemed to be taken up by the ab-

sorbents, as he passed urine, and perspired freely after their administration.

The appearances on dissection elucidate the nature of this patient's case in the most satisfactory manner; the situation of the tumor in the angle betwixt the gullet and the stomach, rendering the obstruction to the passing of food more or less complete, according to the state of the stomach itself; and the formation of the abscess in the latter period of his life, producing permanent instead of the occasional dysphagia.

The tuberculated state of the gullet may offer some explanation of the origin of the formation of the tumor, which seemed to be composed of a mass of diseased glands.

## CASE

OF

## MALFORMATION OF THE HEART.

By W. F. HOLMES, M. D. Montreal, Lower Canada.

Communicated by Dr ALISON.

*(Read 5th March 1823.)*

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THE following case of malformation of the heart, is, I believe, unique, as far as the appearances extend, though several, in which similar effects on the circulation must have been produced, are to be found recorded. Many of the cases collected by Dr Farre, in his *Essay on Malformations of the Heart*, resemble this in one or more particulars, but no one exactly. Though, from the existence of all the parts that are found in the natural state, it might be classed among cases of imperfect double heart, yet it may perhaps be more correctly considered intermediate between them and those of single heart, as from the relations and small capacity of the right ventricle, it can be looked upon only as the com-

mencement of the pulmonary artery. The effects on the constitution of the blood would evidently be the same as if only one auricle and ventricle existed.

Isaac N., aged twenty-one, of a delicate habit, had been affected from infancy with a palpitation of the heart, attended by a peculiar blueness of the cheeks and lips, more remarkable at one time than at another. The palpitation was much increased by quick motion, and subject to aggravation after any irregularity, which a turn for dissipation frequently presented. At these times the difficulty of respiration was great, and attended by pain in the region of the heart. For a few years past he had had a more severe attack every winter, apparently originating in intemperance, commencing with bilious vomiting, and yielding to bloodletting, cathartics, and antispasmodics. Less severe attacks occurred more frequently, in most of which abstraction of blood seemed of advantage. That which terminated his existence commenced on the 13th of January by vomiting, which continued for nearly twenty-four hours, great anxiety and oppression, and violent pain about the præcordia. He was unable to lie except in one position, on his back, inclining to the left side. Any attempt to lie on his right side was followed by a sense of pain and suffocation, which obliged him to change his posture. This inability of remaining on the right side was

present even in health; and if, by accident, he turned during sleep, he was awakened by acute pain.

To relieve the urgency of the symptoms, blood was abstracted on the 14th. On the 15th and 18th, a blister was applied to the chest, and opiates, in combination with salines and antispasmodics, were employed with but trifling relief. The tongue being much furred and skin hot, cathartics were used. These remedies were continued throughout the disease.

During its continuance it more than once appeared to yield, the patient getting comfortable sleep, and being free from pain, and the palpitation less annoying. The tongue became clean, but again furred towards the close; yellowness of the eyes and skin, and high coloured urine, were more or less present, during the progress of the complaint. Some time before his death, the feet began to swell, the œdema increased gradually, and was soon followed by fluctuation in the abdomen, and effusion in the chest. The presence of fluid in the pericardium was suspected from the patient being easy only while inclining forward, a symptom which appeared a few days before death, but became less prominent afterwards. At the same time, a peculiar sound was occasionally heard, particularly when the ear was made to approach his breast, similar to that produced by bubbles of air entering a bottle full of water; and frequent inclination to syncope, commonly induced by attempts to move, supervened.

The little probability of being of service, confined the practice in the latter part of the treatment to stimulants and anodynes, except that, in consequence of enlargement of the liver being perceived, submuriate of mercury was conjoined. No specific effect followed its exhibition, but it appeared useful by acting on the bowels. Three days previous to the termination of the case, cough came on, attended by expectoration of mucus, at first mixed with blood.

On the 8th of February, he was evidently sinking; the palpitation constant, countenance very anxious and mind depressed, much oppression, respiration short; incapacity of raising the mucus from the trachea. He died early next morning.

The pulse throughout the disease was generally very irregular; sometimes intermitting, then full and bounding, followed by a tremulous motion of the artery; at other times it was regular but small. At the beginning of the disorder the pulse at the wrist was imperceptible, and continued so, with cold extremities, for several days. It was observed, that the arterial dilatations were occasionally not synchronous with the contraction of the heart, the latter having several pulsations in the interval of those of the artery, without any regularity.

A remarkable circumstance attending the case was the apparent convalescence. On the 31st, every symptom was aggravated, the effusion gaining ground, and there appeared little probability of his surviving many hours. To our surprise, how-

ever, on the 1st he was considerably relieved, and continued to improve; the œdema and swelling of the abdomen became stationary, and for three or four days there appeared a prospect of his recovery. This proved fallacious; the urine became scanty and high coloured; the thighs, penis, and left arm, œdematous, and his abdomen larger. He suffered less, however, than at the commencement.

The body was examined in the presence of Messrs Arnaldi, Caldwell, and Robertson, the two former of whom attended the case with me.

*Sectio Cadaveris.*—In examining the body externally, the lower extremities, parts of generation, and lower part of the abdomen, were considerably swelled from effusion into the cellular membrane. On opening the abdominal cavity, fluid of an orange colour was collected, amounting to nearly a quart. The liver presented itself enlarged and hardened. The hardness was general, and extended through its substance, which, when cut into, appeared mottled with yellowish specks. The pyloric extremity of the stomach was lower than usual. A few of the glands at the root of the mesentery enlarged and hard; intestines healthy. Both sides of the thorax contained fluid, but not to a large amount. The pericardium occupied almost entirely the left cavity, the lungs being pressed into the upper and back parts; they were healthy except in containing fluid effused in their substance. Upon slitting up the pericardium, which contained from three to four ounces of serum,



the heart came into view, generally enlarged, particularly the right auricle, the size of which was increased to the capacity of a pint. When opened and cleared of the blood with which it was filled, the musculæ pectinatæ appeared remarkably strong. The interior rough and hard, apparently from earthy deposition, and giving a gritty feel, when the knife was passed over it. The foramen ovale was pervious, admitting easily the handle of the scalpel or the little finger. The aorta was then opened, and the section continued down into the ventricle. Its coats here and there were marked with yellow spots; the corpuscula Morgagni, and two of the semilunar valves, were red, and increased in size. The parietes of the left ventricle were thinner than usual, and the cavity much larger than natural. Passing the finger into what appeared the opening between this ventricle and the left auricle, it passed by a large opening into the right auricle; and it was then found that there was no communication between the right auricle and right ventricle. The right ventricle was much less than natural. The pulmonary artery, of its natural size, passed from its upper end; the blood had found ingress into this ventricle from the left ventricle, through an opening with tendinous margins, just below the semilunar valves of the aorta. Its size about half an inch by three-fourths of an inch. The præternatural orifice between the right auricle and left ventricle was large, and furnished with valves similar to the tricuspid. Part of these were thickened, and of a cartilaginous hardness. At the

base of one of the divisions, there was a tumor of the size of a bean, containing a thickish yellow matter. The left auricle was partly concealed by the columnæ carneæ, and their tendinous terminations affixed to the valves just mentioned, and was a little enlarged, but natural, as were the veins flowing into it.

The course of the circulation in this curious case must have been as follows. The blood entering the right auricle by the two cavæ, passed almost entirely into the left ventricle; a small portion probably finding its way into the left auricle. A part of the blood would pass during the diastole of the ventricles from the left into the right ventricle, and be propelled through the lungs, to be returned into the left auricle. The blood itself would constantly remain in a state very little oxygenated, as the portion returning from the lungs would be mixed with the returned venous part, before being propelled into the aorta.

The accompanying sketch (Plate II.) may serve to explain the appearances.

- a*, The pericardium held up by pins.
- b*, Part of internal surface of the aorta, with the orifice of one of the coronary arteries.
- c*, The left auricle.
- dd*, The left ventricle, crossed by a probe placed under the columnæ carneæ and cordæ tendineæ.
- e*, A part of the right ventricle, with the sides separated by a piece of whalebone.

- f*, The remaining part of the right ventricle. To this portion the pulmonary artery remained attached.
- g*, A probe passed through the oval opening between the two ventricles.
- h*, The passage from the left ventricle into the right auricle, which was as large as the left auricular orifice.
- kk*, The parietes of the left ventricle.

CASE  
OF  
TUBERCULAR DISEASE  
OF THE  
PERITONÆUM AND OMENTUM,  
COMBINED WITH  
TYMPANITIC AFFECTION.

By WILLIAM MONCREIFF, M. D. Fellow of the Royal College of Physicians, and of the Society of Scottish Antiquaries; and one of the Physicians to the Royal Public, and New Town Dispensaries.

*(Read 3d April 1822.)*

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J. S. æt. 40, a widow, of a sallow complexion, and much emaciated, applied to the New Town Dispensary on the 5th of October 1821. She complained of loss of appetite, indigestion, and constipation, accompanied with the globus hystericus; the pulse was natural, and the tongue foul: made no other complaints. The catamenia were reported to be regular. Her ailments commenced about three weeks before her application to the Dispensary, after exposure to cold and wet, when working at the harvest. Had used no remedies. Some purgative medicines were prescribed.

On the 10th of October, she sent to inform us that she was much worse, and wished to be visited at home; at which time she complained of severe nausea and vomiting, with constipation and pain all over the abdomen, but principally of the right hypochondrium and left iliac region, increased on pressure. The abdomen was very tense, quite tympanitic; the pulse natural; tongue dry and furred; urine of natural quantity, high coloured. No alvine evacuation for four days. Reported to have had a similar attack about two years before, which yielded to purgatives and enemata.

It would be tedious and unprofitable to insert here the daily reports taken of this hopeless case, or the particular remedies prescribed. Suffice it to say, that she was twice bled from the arm, frequently leeches, had two blisters to the abdomen, with fomentations and warm bath. Purgatives and antispasmodics were given by the mouth, but were almost constantly rejected by vomiting, and did not operate on the bowels. Purgative injections were given repeatedly, but she had no alvine evacuation until the 15th, after a strong enema, which brought away some lumpy dark-coloured fæces. The tympanites, however, continued until the 23d of October, when the abdomen became more relaxed, and some irregular hardness was felt in the right hypochondrium and left iliac region. The pulse had now risen to 100, weak; and the urine was scanty and high coloured. On the 24th the tympanites was gone, but a sense of fluctuation was evident in the

abdomen: no anasarca. Diuretics were then ordered, which were continued until the 30th; the urinary discharge was increased, but the vis vitæ sunk rapidly, and she died on the 31st, at 9 P. M.

*Dissection*, Nov. 2.—The abdomen was tumid, and on being punctured, four English pints of serum flowed from it. On turning back the parietes, the omentum appeared reddish and tuberculated, extended over nearly all the abdomen, and firmly attached at its bottom to the fundus of the uterus. When turned back, it was seen to be much thickened, through all its extent, in various places as much as half an inch. Both sides of the omentum, the peritoneal covering of the intestines, and lining of the abdominal parietes, were thickly studded with tubercles. The small intestines adhered to each other, and were slightly covered with pus. The covering of the liver was tuberculated, but its substance was generally healthy, except one tuber circumscriptum in its margin. The peritoneal side of the diaphragm was tuberculated, but the pleura was quite healthy. There was scirrhus of the pylorus, and beginning of the duodenum. The stomach was every where else much thinner than natural, and its internal surface was every where loaded with blood. The other viscera were healthy.

This case is similar, in many respects, to those recorded by Dr Baron of Gloucester, in his ingenious and scientific work on Tubercular Diseases; to

the one by Dr David Hay in the *Edinburgh Medical and Surgical Journal* for 1818, page 623.; and to the case mentioned by the reviewer of Dr Baron's work, in the same excellent *Journal* for 1820, page 135.

I have never witnessed such an extensive tubercular disease at any former dissection, as in the case now submitted to the Society. It is remarkable (and shews the very insidious nature of the affection) that the patient was able for harvest-work only three weeks before the fatal attack, although the organic derangement must have been going on for a long period, probably from the time she was reported to have had a similar disease two years before.

With regard to the treatment in cases of this nature, very little can be done, except in the earliest stages of the disorder. I beg leave to refer to Dr Baron's work for an account of the primary and progressive symptoms of this deplorable malady, and of the treatment found most beneficial in its different stages.

7. YORK PLACE, }  
30th March 1822. }

ON

## MELANOSIS.

By WILLIAM CULLEN, Esq. Member of the Royal College  
of Surgeons, Edinburgh;

And ROBERT CARSWELL, Esq.

(*Read 7th May 1823.*)

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“ Morbus informis, horrendus truculentus, niger.”

*Incerti Auctoris.*

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ON the 11th October 1822, we observed in a horse the disease termed Melanosis, developed to a remarkable degree. The colour of the animal was grey, inclining to white, and, from its emaciation, it seemed to have suffered under the influence of a disease of long standing. During life, we noticed, under the root of the tail, and in the neighbourhood of the rectum, a number of tumours of different sizes, hard, but moveable; and, under the delicate mucous membrane of the verge of the anus, they were seen to be of a deep black colour. On the left buttock we felt an enormous mass of the same kind of matter, immediately under the skin,



but connected pretty firmly with parts deeper seated. In the centre of this mass there existed an ulcerated opening, of the size of a sixpence, from which a fetid pus could be squeezed, in no great quantity, and mixed with small fragments of the matter of melanosis. The cavity of the abscess could not be detected by any external examination, as there was no fluctuation perceptible. Of the tumours in the neighbourhood of the anus, some had contracted adhesions to the skin, others were free; they varied in size, some being as small as peas, while others had attained the bigness of a Spanish nut. At no other part of the body were similar tumours noticed in the subcutaneous cellular texture, but, on dissection of the animal, great masses of them were found in other places. There were many seated at the root of the neck, on the right side, corresponding to the subclavian region in man, partly in the cellular substance lying between the muscles, and partly in the very substance of these latter. There were a few near the base of the scapula, under the panniculus carnosus. Some were found in the groin, on the same side, in the seat of the superficial absorbent glands. We noticed one large mass, of the shape and size of an orange, between the sixth and seventh ribs of the right side, which had originated in the substance of the intercostal muscles, and had increased inwardly, so as to raise the pleura from the subjacent bone and muscular strata. The peritonæum had melanose matter lying upon it in streaks at that part where, leaving

the bladder and rectum, it gives a covering to the last lumbar vertebra. The pleura in several places was similarly affected, and chiefly where it forms the mediastinum, and gives a covering to the pericardium. From near the termination of the aorta, down the lumbar region of the left side, into the pelvis by the side of the rectum, and out of it by the exterior aperture, there extended an immense chain, beginning above by one or two small insulated tumours, situated on the aorta, gradually increasing in bulk, till, at last, the black matter formed near the anus masses as large as a child's head. From the anal region, the disease appeared to have spread into the muscles of the buttock. Such were the situations in which this curious disease was found, the substance of all the viscera being quite healthy.

After a careful examination, we were satisfied that the large masses were a congeries of smaller ones of different sizes. They were each surrounded by a cyst of condensed cellular membrane, varying in thickness, but, generally speaking, remarkably firm. The cysts did not communicate, but seemed merely to have contracted adhesions with each other, and thus to have formed the large masses. The size of the individual cysts was various, some being no larger than peas, others as large as an apple, and of all intermediate magnitudes. This description applies only to the melanosis found in the cellular membrane, for the investing cyst of that observed in the muscular substance was considerably thinner, and,

in some places, could hardly be detected. The tumours, when cut into, were all of a deep black colour, like the pigmentum nigrum, or China ink. As to their consistence, most of them were as hard as cheese, while others were softer, and could easily be torn with the fingers. The black colour was uniform every where, and did not exhibit any white bands, or striæ, as are seen in tumours of a scirrhous nature. The vessels in their vicinity were not enlarged, and no signs of any active process going on could be observed. Nerves were seen, sometimes running over the surface, sometimes traversing the very substance of the black masses, but they had undergone no kind of alteration. The muscular texture itself was unchanged, and seemed merely separated in its fibres, and expanded, as occurs when considerable tumours are situated below a muscle; and, even when the very black matter was lodged in this texture itself, the fibres could still be traced unchanged. The pus seen to be lodged in the buttock, and already described in part, was found to be furnished, not from a large cavity, as had been suspected, but from two or three abscesses, about the size of a walnut, seated a little below the skin, and in a muscle affected with the black disease. The melanose matter in the neighbourhood of them was much softer than elsewhere; and we noticed that small grains of it were mixed with the pus secreted. The muscular fibres, also, near the purulent cysts, had undergone a change, having become extremely hard, of a greyish

colour, and, upon the whole, not unlike the muscular coat of the stomach, when that organ is affected with true scirrhus.

On the pleura and peritonæum, the disposition of the melanosis was somewhat different. It was effused on the surface of these membranes, not in round masses, but in streaks and patches. There seemed to have taken place on their surface a formation of cellular tissue, into which the black matter appeared to have been poured out, for it could be scraped off, and the serous coat was still left smooth and entire. The matter, too, was much softer, so as to be semifluid: the membranes upon which it was formed bore no traces of vascularity.

We have thought proper to lay this case before the Society, because we think it well calculated to convey a general idea of melanosis, even in the human subject. The striking appearances, as above recorded, are often met with in horses, constituting a peculiar disease, to which the French Veterinary Surgeons have given the name of Charbon, or *Maladie charbonneuse*. We have repeatedly had opportunities of observing it in these animals, and those of white or grey colour seem to be attacked by preference; a fact that has been noticed by all writers. The description we have given will be found to apply to almost all cases; but, of course, numerous varieties as to the seat and degree of the affection will present themselves. We venture to assert, that rarely, if ever, will the organic structures of the body be found degenerated, or convert-

ed into melanosis; and, commonly, the tumours, wherever situated, will be found to afford evidence of their being a peculiar new formation. In one instance, in a horse, melanosis existed under the periosteum of the os ilium, and formed a tumour as large as a man's fist, but the bone was in no respect diseased or altered from the natural state \*. Before concluding our remarks on this subject, we may be permitted to observe, that it were to be wished the Veterinary Surgeons of this country would make some inquiry into this matter, since they could not fail to throw considerable light on the corresponding affection in man.

In the human subject, we occasionally find the disease equally well marked in its characters, and equally independent of other alterations of structure. In the year 1821, a woman was brought into the Pavilions of the School of Medicine in Paris, whose body we had an opportunity of examining, along with M. Breschet, and Professor Meckel. In the right groin, there was an ulcerated surface about as large as a crown-piece, the bottom of which consisted of a pultaceous substance, of the colour of china-ink, and of the consistence of cream at the surface, but much firmer below, where it was in contact with the cellular tissue. The

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\* Dr Monro informs me, upon the authority of an eminent Veterinary Surgeon, that melanosis is rarely, or never, seen in the horses of this country, but that it was exceedingly common in the cavalry regiments during the whole of the Spanish campaigns.

edges were irregular, not everted, nor thickened, and pale, and the sore was totally without fetor; a state sufficiently indicative that it was not a mere sloughing sore, as, judging from external appearances, one might have imagined. There were in its neighbourhood a number of small, hard, round tumours, evidently consisting of the matter of melanosis, since that peculiar colour was discernible through the skin. The labia pudendi and nymphæ also had one or two tumours situated immediately under their cuticular lining. On laying open the abdomen, we found a distinct chain of melanose bodies, extending from the groin up towards the diaphragm, in the course of the iliac vessels. They were of different sizes, from that of an orange-seed to that of a walnut; some of them were globular, others ovoid, and all of them, as in the horse, were composed of a pretty firm cyst, containing a deep black-coloured matter of various degrees of consistence. We were forcibly struck, on observing that the peritonæum was in no respect altered; that the cellular and muscular tissues were in the healthy state; and that there were no appearances of vascularity, either arterial or venous, as might have been expected, had it been a fungoid malignant disease. As it was the first well marked specimen we had an opportunity of observing, we concluded, from the shape, size, and situation of the tumours, that it was a case of degeneration of the lymphatic absorbent glands; but subsequent cases have convinced us, that these were really morbid

structures of new formation, occurring accidentally in the seat, and, from the nature of their cyst, imitating the form of these bodies. In this observation we paid particular attention to the state of the ulcer of the groin, with a view to obtain a knowledge of the pathological changes incidental to the disease; but our conclusions were all of the negative kind. It was not fungus hæmatodes, for there was no fungus to be seen, nor any appearance of hæmorrhage; it was not a slough, for there was no fetor; nor was it a malignant ulcer, for there were no marks of great vascularity, as commonly occurs in tumours of this description. We were, in fact, forced into the hypothesis, that the skin had gradually thinned and given way, and a peculiar absorptive process had taken place; but this is mere conjecture. The want of precise information is the more to be regretted, as this case furnishes us the only example with which we are acquainted, where the melanose tumours had actually made their way to the surface.

But by far the best specimen of the disease we have either met with or read of, occurred here lately in the clinical practice of Dr Home, by whose kind permission, and that of the Managers of the Royal Infirmary, we are enabled to present an account of it to the Society.

On the 18th of March last, John Houston, aged fifty-one, a shoemaker, complained of pretty severe symptoms of pleurisy, for which he was blooded, blistered, and purged, with considerable

relief. Up to the 23d, the symptoms diminished daily, though the cough continued ; but this latter symptom also subsided in a few days under the use of purgatives, and mucilaginous mixture with paregoric. The 28th, a hæmorrhoidal affection supervened, that yielded on the 30th to the application of leeches. April 1st, he complained only of debility, for which generous diet with white wine was ordered ; but he died in the course of the night.

We beg leave to call the especial attention of the Society to this case, as bearing upon a point of doctrine we shall have occasion to enlarge upon in the course of this paper. Here was a man submitted daily to the inspection of a physician of long experience, and acknowledged discernment, in the course of clinical duty, and under the eyes of intelligent pupils ; yet, who exhibited no peculiar symptoms that could have led to the suspicion of deep seated internal disorganization. In the course of the spring 1822, Houston laboured under a severe affection of the right eye, attended with headache and pain of the orbit, for which extirpation was deemed necessary. Since the operation, the patient remained free from any painful feelings referable to that organ.

On examination of the body thirty hours after death, the first incision exposed a number of black globular bodies, lying in the cellular tissue between the pectoral muscle, and third and fourth ribs of the left side, about the size of peas, and some of them adhering to the periosteum. The substance of the



rib itself was completely black, as was also the sternal third of the clavicle of the same side; but these bones were in no other way altered from their natural state. Upon opening the chest, the pleura was found studded with similar tumours, here and there insulated, but in general aggregated, so as to resemble clusters of purple grapes. The last mentioned phenomenon was particularly remarkable on the right lung, along the bodies of the vertebræ on both sides, and upon the upper surface of the diaphragm on the left. Many of the tumours were hardly raised above the pleura, but others had long slender necks, so that they were like polypi. In colour, most of them were jet black, others of a deep purple, or even reddish hue, while a third sort seemed to contain portions of a peculiar white colour, blended with black. The lungs were extensively beset with these tumours; and several of an exceedingly small size were detected under the mucous membrane of the bronchiæ. The pericardium, and the very substance of the heart were studded with melanose bodies. As the cause of the symptoms under which the patient laboured during life, upwards of three pounds of fluid were found in the cavities of the pleura, and there was a thin pellicle of albuminous matter covering the surface of the lungs. In the abdomen, the liver, spleen, kidneys, omentum, and peritoneum in different places, were affected in the same manner; but the tumours in the liver contained a considerable portion of white cerebriiform matter. To shorten

the description, perhaps already too long, we may state in general, that similar tumours were found connected with the internal table of the skull, where they had formed for themselves little excavations, in the subcutaneous cellular substance of the thorax and abdomen, so as to be discernible through the integuments; and, lastly, among the fibres of the intercostal muscles. Doubtless, had the examination been pushed further, we might have found the disease in other organs, but from peculiar circumstances, it was impossible for us to render the dissection complete.

This is the proper place for noticing the appearances found in the eye at the time it was operated on. The situation of the vitreous humour was completely occupied by a black looking fibrous mass, pushing the choroid coat and retina into the posterior chamber. These tunics had undergone no sort of alteration, and the sclerotica was everywhere entire. The cornea had sloughed, but this was to be attributed to the general distension of the globe, and by no means to any alteration in the texture of the tunic, since it was nowhere in contact with the morbid matter lodged behind the iris. There was a considerable mass of black matter lodged posteriorly to the globe, and deep in the orbit, apparently in the fat and cellular tissue surrounding the optic nerve. When we examined the orbit after death, we observed that the disease had been reproduced in its old situation, and at the expence of the cellular tissue; for the muscles

and nerves, so far as we could trace them, had undergone no alteration.

As to the tumours found in the different parts of the body, they possessed certain general features. They consisted of a cyst separated by a loose cellular tissue from the surrounding textures, and containing the peculiar black matter of the disease in different states of consistence. In some pretty large tumours the matter was nearly solid, and in others, those exceedingly small, nearly fluid. No external differences were to be observed in these two species; there was no regular gradation in size; no difference in vascularity, that could have led us to suppose they were different states of the same disease, or in different states of development. In the liver only a remarkable variety was noticed. The tumours here were as large as chesnuts, some of them white, consisting of cerebriform matter, others were pure melanose, and others again contained melanose and cerebriform matter together; but all of them had cysts tolerably distinct from the surrounding hepatic texture.

Dr Alison, the distinguished Professor of the Theory of Medicine, has kindly permitted us to communicate to the Society the following case, which affords another excellent example of simple melanosis.—Rachael Bruce, aged forty-two, was admitted into the Royal Infirmary on the 3d of June. She complained of severe pains shooting down from the loins to the inferior extremities, and round the abdomen. She had similar pains in the right shoul-

der and arms, increased in the night-time, or by motion. She had become weak and emaciated since her complaints began, and was liable to shivering, followed by flushing and profuse perspiration, which increased her debility without relieving her pains. The abdomen was swelled, but did not fluctuate on percussion, and the distension varied in degree at different hours in the day. She had thirst, with scanty high coloured urine, not coagulating by heat. The integuments of the abdomen were flaccid; and a hard, moveable, tumour could be felt in the iliac and hypogastric regions. She was also liable to paroxysms of dyspnoea during the night-time. Her appetite was impaired. She had bad taste of mouth, with white and dry tongue. Her bowels were reported to be regular, but she had occasional nausea. Sleep deficient.

She stated her complaints, which were of five or six weeks standing, to have commenced after exposure to cold, with shivering, and with pain and stiffness of the loins, and of the hip and knee joints of the left side. The enlargement and induration of the abdomen had been remarked during the last fortnight only.

For these symptoms, the treatment at first instituted consisted of leeches, fomentations, anodynes, and particularly Dover's powder. Tympanitis occurred on the 7th, for which pills of calomel and opium were given, and continued till the 9th, when they were stopped, in consequence of the tenderness of the mouth. A day or two afterwards, mercurial

pills were substituted, shortly followed by the usual effects of mercury ; but no evident relief ensued, and the pains of back and lower extremities, with distension of the abdomen, not only continued unabated, but were even aggravated by the supervention of globus hystericus. Up to the 20th there was no material alteration in the symptoms. Purgatives, and chiefly castor-oil, were administered to correct the irregularity of the bowels. On the 21st there were found several small painful tumours on the integuments of the abdomen, which she declared to have existed from the commencement of her illness. She was this day examined by a skilful accoucheur, who reported the tumour felt in the hypogastric region to be unconnected with the uterus. On the 24th, copious sweating, with involuntary discharge of urine, was added to the other symptoms. 1st July, Great debility supervened, with decided hectic fever, and tendency to sloughing of the sacrum. On the evening of the 7th she had vomiting of a dark coloured matter, and died soon after. The treatment in the last days of her life was merely palliative, and consisted of laxatives, alternating with opiates.

*Sectio Cadaveris.*—There was great general emaciation, and several small dark-coloured tumours, that had been visible during life, were observed distributed over the body. These tumours were largest and most numerous in the mammæ. They were imbedded in the cellular substance ; were encysted ;

and when cut into, were found to contain a deep black coloured matter, of soft and pulpy consistence. Within the abdomen, most of the cellular and adipose textures had disappeared. The peritoneum lining the parietes was of a blackish colour, and the black matter was irregularly deposited in striæ, and spots upon the inner side of the membrane, which had lost much of its usual transparency. The omentum presented a similar appearance, and several globular shining tumours of a black colour were appended to it, which, when cut into, poured out a similarly coloured fluid. Between the folds of the mesentery, and beneath the serous membrane of the intestines, there were numerous black spots and small tumours. There was some unusual vascularity of the mesentery, and many small vessels containing red blood could be observed upon the portions which formed cysts to the black tubercles. The ovaria were many times of the natural size, and were seated in front of the uterus, occupying also the lateral iliac regions. Their external surface had a dark, shining, lobulated, appearance, with numerous ramifications of vessels upon the peritoneal covering, beneath which black matter was irregularly deposited in spots, giving a mottled appearance to the whole. When cut into, their substance was uniformly black. The cellular tissue still retained its consistence, and vessels containing red coagulated blood could be traced through it. Several distinct cysts or cavities were found in their substance, which poured out a black liquid when opened. The kid-

neys, liver, spleen, and the mucous coat of the stomach and intestines, were all free from black matter, although it was deposited in the cellular tissue connected with these organs. On removing the sternum and skull-cap, it was observed that the whole texture of the sternum, the anterior portion of the ribs, and great part of the parietal and occipital bones, were black, more brittle, and of softer consistence than natural, but without enlargement or ulceration. The periosteum was natural, except that in some places there was deposition of black matter beneath it. The whole inner table of the skull, when removed from the dura mater, was of a darker hue than natural, and, in some places, where the black matter was deposited in irregular patches on the bone, there were corresponding stains on the surface of the dura mater. The substance of the brain was healthy, but several minute striæ of dark matter were observed in the course of the ramification of the small vessels, on the membranous coverings of the base of the brain and choroid plexus. A large quantity of serum was effused under the arachnoid membrane, and in the ventricles. Within the thorax, a number of small black tubercles similar to those in the integuments, were situated on the surface of the pleura costalis, and others of larger size were attached to the surface of the lungs. All of them appeared enveloped in a slender cyst. The substance of the lungs was dark, and some minute tubercles were imbedded in it. Similar spots were noticed beneath the pericardial coverings of

the heart, which contained some coagulated blood in its cavities, and was softer than usual.

Having now laid these several cases before the Society, we may be permitted to make a few observations upon some general phenomena which the disease presents. And, omitting, till another opportunity, the mention of it in mucous membranes, where it assumes the form of black secretion, and, passing over its combination with cerebriform degenerations and scrofulous tubercle, we shall proceed to offer some remarks on the disease in general, and attempt, with all humility, to form some conjecture as to its real nature.

Melanosis is commonly considered by those who have paid some attention to it, as partaking of the nature of cancer and fungus hæmatodes, and, like them, to be invariably fatal; but minute examination of many specimens has convinced us, for the present at least, that these diseases are quite of a different nature, though, doubtless, they may sometimes be blended together. To illustrate this opinion, we may be allowed to remind the Society, that scirrhous attacks chiefly glandular structures, and of them those only which may have been in a state of inflammation; while the hæmato-fungoid tumour attacks every kind of structure. They both of them begin in one definite point, gradually extend their ravages in every direction, convert all the tissues in their vicinity, by a kind of assimilative process, into their own matter; and, finally, at the



end of a shorter or longer period, prove invariably fatal, either by extensive sloughing, profuse hæmorrhage, great constitutional irritation, or by a combination of all these. In their course, they are generally attended with severe lancinating pains, peculiarly agonizing, and with great increase of vascular action, both arterial and venous. Now, it is worthy of notice, that in the several well marked cases that have fallen under our observation, none of these phenomena were seen. The matter of melanosis was constantly found in a regular cyst, a feature which completely distinguishes it from the other malignant degenerations. Indeed, this may be considered as one of the distinctive characters of melanosis, since in the liver and kidney, where so little cellular tissue exists, still the cyst was entire, and the surrounding parenchymatous substance unaltered. Again, we have seen no example where it could be truly affirmed that the textures of the body had undergone any alteration, in consequence of the ravages of the disease. The bones, for instance, were of a deep black colour, but otherwise unaltered. The muscles had their fibres separated and expanded by the tumours, but the fibres themselves were entire, and possessed their natural colour and tenacity. The parenchymatous viscera were not altered in texture; the substance adjacent to the cyst was as healthy as the rest of the organ. Of vascularity there were no traces, not even in the pleura or peritoneum, where bloodvessels might so easily have been discerned. And, lastly, that the disease

is not attended with pain, is clearly demonstrated by the case of Dr Home's patient. What this man suffered before the extirpation of the eye-ball, must be attributed, not to the malignant nature of the affection, but to the distension of the tunics, since, after the operation, he ceased to complain of pain, though the disease had been reproduced, as was found on examination after death. During his residence in the hospital he suffered no particular constitutional irritation, and made no complaint not referable to the pleurisy under which he undoubtedly laboured.

These considerations, then, have induced us to believe, for the present at least, that melanosis, in its simple form, is of a nature quite distinct from cancer, both in its seat, symptoms, progress, and anatomical characters; and with this negative kind of knowledge, we fear we must rest satisfied, till it shall have excited more generally, and for a longer time, the attention of the medical world. Laennec, who has contributed so much to the increase of pathological knowledge, has concluded, from his observations, that melanosis has two stages like cancer, a stage of crudity, and of *ramollissement*; but, if it be permitted to persons of so limited experience as we are, we would venture to suggest, that what he calls *ramollissement* is nothing but melanosis originally secreted in a more fluid form than common. If it were true, as he supposes, that the matter, in proportion as it is more elaborated, becomes softer, we should expect the larger the

mass the less consistence it should possess ; but, as far as our observations go, the reverse seems rather to be the case, the smaller tumours being the softest, and often as fluid as cream. From another opinion of M. Laennec we must dissent, in as far at least as melanosis is concerned. He states as a general proposition, that those morbid structures which are without analogy in the healthy state of the body, have all a tendency to soften and break down, that they are all of them attended with great constitutional irritation, and that the effort of nature, though often abortive, is always to eliminate them from the body. Melanosis must form an exception to this rule. We have seen melanose tumour in the substance of the heart itself, yet no unusual constitutional affection ensued ; and the want of vascular action has convinced us, that nature is at least wholly inactive while they are present, that is, she institutes no process for their removal. Melanosis, therefore, in its simple state, will form a disease entirely different from any with which we are acquainted ; differing from cancer in the points above specified, and from scrofulous tubercles by shewing no tendency to suppuration ; and it certainly can never be classed as one of the products of inflammation, either acute or chronic. It is an affection *sui generis*, of which it must be said, in the present state of our knowledge, either that it is a perfectly innoxious secretion, or that we are unacquainted with its real nature. For our parts, if we incline to the former conclusion, it is

because we think ourselves warranted to do so from the cases we have seen, fully prepared, however, to retract, or modify our opinion, as soon as a more enlarged experience shall have shewn us our inaccuracy.

Having now concluded what we have to say upon simple melanosis, we ought to proceed to consider of its combinations, but we must defer this part of the subject till another opportunity. We may, however, state here to the Society, that we hope to be able to demonstrate the identity between the black secretions of mucous membranes and melanosis. We shall shew, that, when in combination with the cerebriform structure, this latter disease possesses no greater than usual malignity; and lastly, that nature even employs melanosis as the means of repairing the ravages of other affections, as we think occasionally takes place in some phthisical ulcers and fistulous sinuses of long standing. At the same time, we shall endeavour to give some account of the prognosis that may be formed, since, till some remedy, hitherto sought in vain, shall have been discovered, thus far only can the physician go, and no farther.

CASES  
ILLUSTRATIVE OF THE  
SEDATIVE POWERS  
OF THE  
DATURA STRAMONIUM.

By JAMES BEGBIE, M. D. Fellow of the Royal College  
of Surgeons of Edinburgh.

*(Read 4th June 1823.)*

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THE attention of the profession in this country, was not, I believe, particularly called to the medicinal properties of the Stramonium till Dr Marcet, in an interesting paper, read before the Medical and Chirurgical Society of London, in June 1816, and published in their Transactions \*, detailed the results of his experience of its use. Störck, it is true, so early as 1762, in a pamphlet published at Vienna, gave an account of its virtues, and the results of its administration in some cases of maniacal, epileptic, and convulsive affections, which were fa-

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\* Vol. vii. p. 551.

vourable to its use. Dr Wedenberg of Upsal, and some other Swedish physicians, following his example, exhibited it in the same class of diseases with some degree of success. More recently, in America, it has been employed to a considerable extent, and highly extolled as a powerful narcotic remedy. The inhalation of the smoke of the herb has long been employed in this country in the paroxysms of spasmodic asthma, and frequently attended with decided benefit; yet, its internal administration was little, if at all, attended to, before the publication of Dr Marcet's cases, nor has much been added to our knowledge of its virtues since that time,—a circumstance the more remarkable, as they certainly appear very satisfactory.

The cases which follow are the only ones in which I have had an opportunity of exhibiting the remedy. They decidedly illustrate its active narcotic property, and its superiority in some cases to other medicines of that class.

In no instance was any bad effect produced from its use. In Case I., after being employed for some time, there was a degree of that unpleasant nervous sensation referred to the throat, which has been mentioned by authors. It was not, however, lasting.

The extract from the seeds, prepared according to Mr Hudson's formula, was the preparation always employed. The dose was one-fourth of a grain, repeated every third or fourth hour during the day, and in no instance increased beyond half a grain.

Some of the cases, I imagine, will be considered valuable in themselves, independent of any interest they may have in connexion with the subject of this communication. The nature of the first I cannot pretend to determine. The early treatment was adopted under the impression, that the symptoms originated from a ruptured vessel, and consequent effusion in the base of the cranium, but the subsequent history of the case sets aside that idea. The symptoms point out a resemblance to those affections termed "Neuralgic," though the present is much more extensive in its nature than any I have seen described. Of the character of the second case there can remain no doubt; it must be regarded as one of acute idiopathic tetanus, assuming a chronic form, and ultimately terminating favourably.

#### CASE I.

Mrs W. aged forty-three, of a spare and delicate habit, had retired to bed on the evening of the 14th March 1821, in perfect health, but was soon seized with violent pain in the occiput, followed by flashing of light, tinnitus aurium, and strong pulsation extending down the neck. She was obliged to get out of bed, and when visited, was found in a state of great agitation, pacing from one end of the room to the other, and constantly exclaiming, "Oh! my head." She soon became very faint and

sick, and vomited once or twice; the surface was cold, and the face pale, pulse 80, and moderately firm, pupil natural, bowels open. Ten ounces of blood were taken from the arm, under which she nearly fainted; a brisk purgative was afterwards administered, and cold applied to the head. On the 15th, the symptoms continuing unabated, another vein was opened in the arm, but syncope threatening, no more than ℥vi. were abstracted; the pain and throbbing continued undiminished. Towards noon, there being considerable tendency to stupor, pulse 84 and firm, ℥viii. were taken from the temporal artery, which she bore well, but the symptoms continuing, ℥xvi. more were taken from the arm in the evening, with some relief. 16th, Had a restless night, pain very violent, and extending all over the head, with strong pulsation at intervals, no stupor, pulse 84, and easily compressed. During the three following days there was no remission; nights sleepless, severe headache, occasional violent pain over the arch of the nose and back of the orbit, producing the feeling of something pushing out the eye, which appeared protruded, its vessels much distended, but the pupil natural, pulse varying from 80 to 90 and weak, much vomiting.

From the 19th till the 25th, Mrs W.'s sufferings were very severe, the pain had in a great measure left the head, but it was equally violent for two days in the neck, shooting along the whole spine, and attended with strong pulsa-



tion ; it afterwards affected chiefly the upper part of the back, and then the patient complained of the most painful feelings of anxiety about the chest, constant and loud yawning, and violent but not irregular action of the heart : the pain descended, and these symptoms subsided. On the 22d and 23d, she screamed violently, on account of pain shooting from the back of the thigh and leg, to the loins and back ; there were then frequent slight convulsions of the limbs, and at times a paroxysm so severe, as to raise her as if by a convulsive effort into the erect posture ; the pulse during this time continued to beat between 80 and 90, and generally weak. Towards the evening of the 23d, and during the 24th, she had several intervals of comparative ease, the pain had left the neck and head, excepting an occasional feeling of acute constricting pain across the forehead. She chiefly complained of burning heat in both thighs, and a prickling sensation extending down the limb ; these so increased that she could not bear the slightest pressure, but had the parts almost completely exposed or covered with iced water, the only application from which she experienced relief ; pulse continuing to range between 70 and 80. Till the 29th, the symptoms gradually subsided, and there was reason to hope that the disease had run its course.

During its progress, a variety of practice had been adopted, with the occasional advice of Dr Abercrombie ; bleedings general and topical, cold, blisters, sinapisms, all had frequent trials ; antimonials and

purgatives were frequently administered; but cold and large opiates were the only remedies from which she derived advantage.

On the 29th, Mrs W. again experienced the most acute suffering. She was suddenly seized with a return of the pain in the head and neck, which was soon followed by the distressing symptoms in the back, chest and extremities, as severe as formerly. The usual remedies were had recourse to, and persevered in for several days without success.

On the 3d of April, the symptoms continuing unabated, the extract of stramonium was first administered, in doses of  $\frac{1}{4}$ th of a grain, and repeated every three hours. During the first day of its exhibition, little or no relief was apparent, and the patient anxiously desired again to have recourse to opium, from large quantities of which she had been enjoying a temporary abatement of pain; but desirous of giving a fair trial to the stramonium, the opiates were carefully withheld, and the extract increased to  $\frac{1}{3}$ d of a grain every three hours. After a few doses, evident benefit was derived, and a diminution of pain followed every subsequent exhibition. It was increased to half a grain, by a few doses of which the symptoms were completely subdued. Its use was then discontinued, but the symptoms again returned. One dose of half a grain mitigated, and three or four more such, at the interval of three hours, completely arrested their progress. In this way, it was found necessary for the patient to be more or less under the influence of the stramonium for two weeks, as, by

discontinuing it, the pain, &c. never failed to return. At the end of that time it was at last abandoned; the patient recovered health and strength, and a short time ago I was informed that there had been no return of her complaints.

### CASE II.

William Balcarras, æt. 14. August 1. 1821, has been complaining for several days of stiffness and rigidity of the inferior extremities (more especially the left), without any other symptom. Can assign no cause; but mentions his having been struggling much some days ago, in order to escape from punishment, and thinks he twisted his back. These symptoms increased, so that he was obliged to desist from attempts at walking; presently the abdomen became hard and rigid; then the muscles of the neck, back and jaw, and in three or four days from the first appearance of the stiffness in the limbs, he exhibited all the characters of well-marked opisthotonos. Bleedings, purging, calomel, opium, and warm bath, were employed with some relief. It was not, however, lasting; the symptoms increased, and on the 6th seemed to be at their height. At this time he was visited by Dr Abercrombie and Dr Duncan *junior*. His appearance was remarkable,—resting almost on the occiput and heels, unable to perform the slightest motion for himself,—the jaw nearly shut, and immovably fixed,—the

abdomen hard as a board, and the extremities perfectly rigid. On turning him to examine the spine, he was lifted, or rolled over, like a piece of inert matter, resting his chin upon the pillow, the abdomen and toes alone touching the bed. He complained of fixed pain in the situation of the 5th dorsal vertæbra, and a sense of constriction at the ensiform cartilage. The irritability of the muscles of the neck was excessive, the least noise, or touch, or even speaking to him unexpectedly, never failed to produce a paroxysm, in which the head was suddenly, and, for an instant, drawn back with great force. The face was much flushed; the features expressive of suffering and apprehension; there was strong pulsation over the neck, especially when one of the spasmodic contractions of the head occurred, and then, for a minute, it appeared as if every vessel in the neck were pulsating violently; the pulse continued to beat above 100, and small; the skin was disagreeably dry, the bowels torpid. At this time the most active measures were resorted to: repeated bleeding, general and topical, blisters, sinapisms, opium, calomel, &c. were all fully tried, and about the 9th the symptoms seemed to yield; the relief was but partial, however, as next day they returned with nearly equal severity, though the trismus had in some measure abated, and the patient was able to swallow with some degree of ease.

The extract of stramonium was now administered in doses of  $\frac{1}{4}$  gr. three times a-day, at first with

no apparent benefit, but afterwards, by increasing the dose to  $\frac{1}{3}$  gr., and exhibiting it more frequently, evident advantage was obtained. The pain became less severe, the spasms less frequent, and the patient was sensible of the relief, after almost every dose. The rigidity of the muscles still continued nearly as much as ever, though the disease had now continued nearly three weeks. The urgent symptoms were, however, subdued, and by a cautious use of the stramonium, and the daily employment of the warm bath and friction, in three weeks longer the patient recovered so much as to be able to walk, though still with difficulty, into an adjoining room. In eight weeks from the commencement of the attack, he was free from complaint. The blood drawn never assumed a buffy coat, but it was remarkably florid.

### CASE III.

A woman, aged 50, had complained for several days of acute pain, extending from a little below the knee to the upper part of the foot, more particularly along the lower half of the tibia; it was deep seated, and referred to the bone. A variety of remedies had been employed, such as leeches, blisters, sinapisms, opium, &c. without effect. The extract of stramonium, in doses of  $\frac{1}{4}$  gr. every three hours, was recommended, but impatient for relief she discontinued its use before any benefit could be ex-

pected, and persevered, for several days in the use of large doses of Carb. Ferri Præcip. with some advantage; the pain gradually lessened, and disappeared. In a second and more severe attack some weeks after, the iron and other remedies failed, and recourse was had to the stramonium in doses of  $\frac{1}{3}$  gr. The relief was remarkable before many doses were taken, and, in the course of a few days, the symptoms disappeared. The patient went to the country soon after, and requested a supply of the medicine, so sensible was she of the benefit derived.

#### CASE IV.

A young man laboured under severe sciatica for several days, which resisted all the usual remedies. After the application of numerous leeches along the affected limb, and blisters to the hip, it seemed to be alleviated, but extended farther down the limb. After eight days of severe pain, the extract of stramonium was exhibited in doses of  $\frac{1}{3}$  gr. every four hours. During the first two days little relief was obtained; on the third the symptoms were evidently mitigated, and his sleep restored. In a few days longer, by continuing the remedy, he was enabled to be out of bed, and soon returned to his employment.

## CASE V.

A coachman, in the act of cleaning his carriage, was seized with sharp pain in the hip, which soon extended down the limb, in the course of the sciatic nerve, and became so severe as to interrupt all motion. The application of twelve leeches to the hip and thigh mitigated the pain, and it was completely subdued in four days, by the use of the stramonium.  $\frac{1}{4}$  gr. was given every third hour, and the patient regularly expressed himself relieved after each dose.

## CASE VI.

Miss M., for many years a martyr to tic douloureux of the lower jaw, after undergoing every species of treatment adopted for the relief of that distressing disease, with little or no benefit, received from Dr Marcet, to whom her case had been made known, a box of pills, containing the extract of stramonium, by the use of which, after some time, she seemed to obtain some relief. It was not, however, constant, and, latterly, the remedy completely failed. Miss M., after years of most painful suffering, died, I understand, rather suddenly of some other disease.

NOTICE

CONCERNING

THE FEVER

THAT OCCURRED IN THE MAGDALENE ASYLUM OF  
EDINBURGH, IN THE SPRING OF 1821,

AS ILLUSTRATING THE

INFLUENCE OF PANIC

IN PROPAGATING

CONTAGIOUS DISEASES.

By ROBERT HAMILTON, M. D. F. R. S. E. M. W. S.  
Surgeon to the Asylum.

(Read 4th June 1823.)

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THAT there are various classes of disease, which may be propagated by the simple influence of panic and imitation, is a fact which has been long established in medical science.

In *Nervous Diseases*, it was placed beyond doubt by the well known history of Abraham Boerhaave \*, and the not less decisive case of the charity-children of the parish of St Roch, at Paris, in 1782 †.

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\* *Impetum faciens dictum*, &c. p. 355.

† Falconer on the Passions, p. 66.



*The diseases to which sailors and soldiers are liable on service*, have also been long recognised as subject to the influence of the mind. The observations of our early circumnavigators soon led them to see, that a cheerful and buoyant spirit was the great antidote against the many evils that were wont to assail them. Our army-surgeons likewise assure us, that so long as expectation and prosperity animate the soldier's hopes, he suffers but little from those privations and toils, which, upon a reverse, straightway induce the long catalogue of the diseases of a camp. I quote the following well authenticated case, as the most striking I have met with, in proving the astonishing influence of the mind on the class of diseases now alluded to.

“ The city of Breda, from a long siege (in 1625),  
 “ suffered all the miseries that fatigue, bad provi-  
 “ sions, and distress of mind, could bring on its in-  
 “ habitants. Among other misfortunes, the scurvy  
 “ made its appearance, and carried off great num-  
 “ bers. This, added to the other calamities, in-  
 “ duced the garrison to incline towards a surrender  
 “ of the place, when the Prince of Orange, anxious  
 “ to prevent its loss, and unable to relieve the gar-  
 “ rison, contrived to introduce letters addressed to  
 “ the men, promising them the most speedy assist-  
 “ ance. These were accompanied with medicines  
 “ against the scurvy, said to be of great price, but  
 “ of still greater efficacy. The effects of this de-  
 “ ceit were truly astonishing. Three small vials of  
 “ medicine were given to each physician. It was

“ publicly given out that three or four drops were  
 “ sufficient to impart a healing virtue to a gallon  
 “ of liquor. We now displayed our wonder-work-  
 “ ing balsams. Nor were even the commanders let  
 “ into the secret of the cheat. They flocked in  
 “ crowds about us, every one soliciting that part  
 “ may be reserved for his use. Cheerfulness again  
 “ appears in every countenance, and an universal  
 “ faith prevails in the sovereign virtues of the reme-  
 “ dies. The effect of this delusion was truly asto-  
 “ nishing, for many were quickly and perfectly re-  
 “ covered. Such as had not moved their limbs for  
 “ a month before, were seen walking in the streets,  
 “ with their limbs sound, straight, and whole.  
 “ Many who had declared that they had been ren-  
 “ dered worse by all former remedies, recovered in a  
 “ few days, to their inexpressible joy, and the no  
 “ less general surprise, by their taking what we af-  
 “ firmed to be their gracious Prince’s cure\*.”

“ This curious relation,” observes Dr Lind, “would  
 “ perhaps hardly gain credit, were it not, in every  
 “ respect, consonant to the most accurate observa-  
 “ tions, and best attested descriptions of that dis-  
 “ ease. It is given us by an eye-witness, an author  
 “ of great candour and veracity, who, as he informs  
 “ us, wrote down every day the state of his patients,  
 “ and seems more to be surprised with their unex-  
 “ pected recovery, than he probably would have  
 “ been had he been acquainted with the nature of

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\* Frederick Vander Mye, De Morbis Bedanis, &c.

“ this surprising malady. An important lesson,” adds Dr Lind, “ is hence to be learned in physic,—  
 “ the wonderful and powerful influence of the pas-  
 “ sions of the mind on the states and disorders of  
 “ the body \*.”

I will not venture to say that the following history is so striking as the above. But it regards a different and not less interesting class of disease, viz. the Common Infectious Fever of this country and climate; and although the effect of panic is universally acknowledged in this class of disease, yet, from there being no recorded cases which establish the fact, the opinion appears to rest on no better foundation than suspicion and general analogy. In truth, the usual circumstances in which an epidemic occurs, afford no opportunity of distinguishing the operation of this from the operation of the other causes which contribute to its progress. The native malignity of the disease,—the wretchedness and destitution of those among whom it prevails,—the panic and anxiety of mind which are excited,—all concur to produce the actual amount of disorder; and few or no data are supplied, by which we may estimate the separate influence of any one of these concurring causes, and assign to it its just share in producing the combined result.

The following occurrence appeared interesting to me, as exhibiting, in its simplest form, the effect produced by depression and anxiety of mind in common Fever; and I now submit it to the judg-

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\* Lind on Scurvy, p. 349.

ment of the Society, only premising further, that, like Vander Mye, I kept a regular record of the facts as they happened ; and as to the candour with which the statement has been drawn up, I must, like him, rely upon the good opinion of my friends, and the intelligent discrimination of those to whom I have the honour of addressing myself.

On visiting the Magdalene Asylum on Monday, the 2d of April 1821, I learned that a girl was indisposed, and in bed. I was informed that in the morning she had gone, in her usual health, to the washing-tub, her general occupation, and that she had scarcely commenced, ere she complained of violent pain in the head, particularly the forehead, attended with giddiness, sickness, cold shivering, and occasional flushings, together with pain in the back, and uneasiness in the limbs. I found the pulse at 96 ; the tongue foul, and the thirst considerable. Previous to my seeing her, she had taken some opening medicine, which had considerably relieved the head.

Fever was at this time prevalent in the town ; and, perceiving the possibility of infection, I directed her to be immediately removed to the sick-room, and there to be kept as isolated as possible ; her bed-clothes to be placed in cold-water, her room to be well ventilated, and then locked up. I ordered an emetic to be given immediately, and a smart purge to be administered a couple of hours afterwards.

I again saw her on Tuesday. The medicines had operated powerfully, but without any marked alleviation of symptoms; and now recognising her as labouring under continued fever, I sent her, in conformity to the invariable practice of the establishment in cases of infectious diseases, to the Queensberry-House. I ordered all the linens to be put into cold water, and the sick-room to be fumigated.

Next day (Wednesday), I found that, on the preceding evening, two other girls, oppressed with disease, had betaken themselves to bed. They had all the symptoms of continued fever distinctly but not very violently marked. They were immediately sent to Queensberry-house; and the precautionary measures which had been used in the former case were carefully repeated in the present.

In an institution where there are from forty to fifty individuals, necessarily confined within their own premises, and which is frequently visited by ladies, whom the purest benevolence incites to hold intercourse with the most degraded of their sex, it is particularly necessary to guard against the germ of contagion. These considerations led to the very diligent use of all the means generally regarded as most efficacious in preventing the spread of infection; and the anxious employment of these precautions probably attracted the attention, and awakened the fears of the inmates, who, cut off from intercourse with the world, are

peculiarly alive to all that takes place within the walls of the Institution.

Be this as it may, a very decided alarm now began to spread among the women. This apprehension was heightened, from its being supposed that those already suffering caught their complaints from clothes brought to the house to be washed, and to which a suspicion of infection was attached.

At an early visit (about 11 A. M.) on Thursday, I found that three others had sickened during the preceding evening, and had betaken themselves to the sick-room ; and that, during the course of the morning, five more had reported themselves sick. On seeing them, I immediately ordered them off to the hospital ; but before this could be effected, three more had fallen under the disease. They were all apparently very ill ; some with cold tremors and shiverings, others with flushed face and full pulse ; some were overcome with nausea and headache, others with retching and vomiting. The whole, amounting to eleven individuals, left the house at four in the afternoon. I ordered their linen to the tub ; directed every room, and especially those which any of the women had occupied, to be fumigated ; in short, the whole house to be washed and ventilated in the most thorough manner possible. Next day I visited these cases in the hospital. They all appeared decided cases of idiopathic fever, and were so regarded and treated by the learned Professor of the Practice of Physic.

At my evening visit a few hours afterwards (at 9 P. M.), I found eight more cases already in the sick-room. These appeared quite as ill as those I had seen in the morning. Some were leaning their heads against the cold wall from the violence of the headache; some were retching and vomiting, unable to lie down; some were shivering from cold, with the *cutis anserina*, and others flushed and burning with heat.

Here, then, in the course of four days, out of a community of less than fifty individuals, there were twenty-two apparently labouring under fever. Some had been ill for several days, and their cases were putting on all the decided features of synochus; and the latter cases appeared even more distressing than the former. The minds of the most stout hearted in the house, not excepting the superintendants, participated in the alarm; and some of the most active and intelligent of the community were prevented from succumbing under their apprehensions and fatigue, solely from the necessity they felt to exert themselves to the utmost.

It now struck me that there was certainly much delusion in all this, and that much must be owing to panic and imitation. Determining, at all events, to act upon this belief, I went to the sick-room, and, in very decided language, stated my opinion. I told them that such rapid spread of disease was never heard of, and insisted that the fumigation must have fortified them against the most virulent contagion:—that though I had no reason to sup-

pose that they wished to deceive me, yet I was satisfied they were deceiving themselves;—that they were yielding to their fears alone, and getting ill merely because others had done so before them. I also collected the women that had hitherto remained well, and pointedly stated the same truths to them. I assured them that they were quite fortified against all infection;—that most of those who had taken ill had probably injured themselves by their apprehensions;—that they had thus exposed themselves to the disagreeable process of a long illness;—that I had seen them in the hospital undergoing a severe treatment, and a painful regimen;—that there was no fear for them, and if they would only keep a good heart, I would insure them against indisposition.

The effects produced were as decisive as I could have wished. The minds of all in the house were immediately re-assured. The tide of opinion set in in the contrary direction; and now they were as confident as formerly they had been desponding. Of the eight patients then in the sick-room, several recovered in the course of the same night. They found that they could sit up, and walk about a little.

Next morning this change in the general mind was still more apparent. Several were going about their usual employments, who were far fitter for their beds; and one girl in particular, who was really oppressed with disease, and threatened with severe typhus, disobeyed my positive injunctions to lie down. With difficulty she was persuaded to take an eme-



tic and cathartic, which for a time relieved her. After much struggling for two or three days, she was at length forced to yield to the progress of the complaint, and was conveyed to the hospital. The other seven, however, were speedily re-established in perfect health, and in a few days afterwards they were all engaged in their usual occupations.

Of the other inmates of the house, in like manner, none were now taken ill for the period of twenty-three days. By this time several had returned from the hospital, and relapsing, were sent back again. On the 28th of April, the first new case was reported; on the 30th, the second; on the 2d of June, the third; and on the 28th June, the fourth and last; and from that day to this we have had no threatening of continued fever in the Institution.

The change of mind, therefore, which was induced on the evening of the 5th of April, appears effectually to have stopt the progress of the disease in seven incipient cases, and to have entirely checked the fearfully rapid progress which it was every moment making through the house.

For further satisfaction, I shall subjoin two or three of the cases, taken at random from the Hospital-books of the Queensberry-house, supplied to me by the kindness of Dr Home and Dr Dumbreck, under whose immediate charge the patients were.

## I.

*April 5th 1821.*—Elizabeth C——, æt. 23, from Magdalenē Asylum. Complains of slight headache, pain of back, nausea, inclination to vomit. Pulse 72, full. Tongue clean. Bowels regular.

Was taken ill this morning with these symptoms and cold shivering.

Secentur capilli.

Sumat Pulv. Ipecac. ℥j. pro emetico,  
et hab. cras mane Sulph. Magn. ℥j.

Lavat. tepida pro cute.

*6th.*—Emetic operated freely, and afforded great relief to the headache. Still complains of pain of back and right side, as also of nausea. Salts have not yet operated. Pulse 76, soft. Tongue pretty clean.

Applic. Empl. Lyttæ pectori.

Hab. Infus. Sennæ ad alvi plen. solutionem.

*7th.*—Pain of breast relieved. Nausea and headache diminished, but complains of vertigo. Pulse 76, full. Tongue moist, and nearly clean. Skin moist, with some perspiration.

Applic. Hirudines viij. capiti.

Rep. Cathart. ex Sulph. Magn. cras mane.

*8th.*—Slept ill. Headache and vertigo relieved by the leeches. Still complains of pain of breast. Bowels not yet affected by the salts. Tongue clean and moist. Thirst diminished. Pulse 76, full.

Sit V. S. vespere.

Contin. Cathart. ad alvi plenissim. solut.

9th.—Was bled last night to  $\bar{z}$ xxiv., with some relief at the time; but during the night the pain of side returned, and still continues. Slept ill. Complains of pain of back and thirst. Occasional rigors. Bowels freely opened by cathartic. Tongue clean and moist. Pulse 120. Heat 100°. Skin warm and moist.

Vespere sit V. S.

Et Applic. Epispast. parti dolenti.

10th.—Was bled last night to  $\bar{z}$ xxiv., with immediate relief. Pain of side greatly diminished. Still complains of pain of back. Blood covered with a buffy coat, and somewhat cupped. Has slight sickness. Bowels open. Tongue clean. Some thirst. Skin cool and moist. Pulse 100, of moderate strength.

Utat. potu ex acido vegetab.

11th.—Slept ill. Pain of breast gone; that of back still continues. Pulse 112. Skin warm. Heat 100°.

R Magn.  $\bar{z}$ j.

Aq. Menth. Piperit.  $\bar{z}$ vj.

Syrup. Zingiberis,  $\bar{z}$ ss. Mis.

Capt.  $\bar{z}$ j. 2<sup>nda</sup> q. q. h.

12th.—Nausea relieved by the magnesian mixture. Slept ill in the early part of the night from a return of the nausea, which still continues. Tongue clean, moist, and tremulous. Pulse 116, of moderate strength. Heat 99°. Considerable thirst, and little appetite, complaining of nausea, after taking food.

Repet. Mist. Magnes.

13th.—Makes no complaint. Pulse 108.

15th, Makes no complaint but of weakness. Pulse 84.

21st, Convalescent.

23d, Last night attacked with rigors; bad night; headache; nausea. Pulse 140. Tongue moist. Pain of right side.

Statim capt. solut. Sulph. Magn.

ft. V. S.

et applicet. Epispast.

Inhalet. vapor. aquæ tepidæ.

24th, Twenty ounces of blood were drawn from the arm immediately after the visit, with some relief to the pain of breast, which has since returned, and continues unabated. Blister rose, and discharged well. Cathartic operated freely. Headache easier, but nausea continues. Pulse 120, less strong. Heat 98°.

25th, In consequence of pain of side continuing unabated; 20 oz. of blood were drawn from the arm, with considerable relief. Slept ill towards morning. Complains of Tinnitus aurium, vertigo, and faintness. Bowels confined. Tongue clean and moist. Considerable thirst. Pulse 120, weak. Skin cool.

Applr. Hirudines capiti.

Capt. Infus. Cathart. ℥iij. ad alv. solut.

26th, Leeches bled well, and relieved the head. Cathartic operated freely. Pain of side easier, but complains of several pains of limb. Pulse 120, weak. Slept ill.

Utatur Mist. Diaphoret.

Pediluv. tepidum.

27th, An anodyne draught was given last night, which procured some sleep. Complains of much pain in the right hypochondrium, increased on pressure or inspiration. Still

complains of pains of joints. Pulse 108. Perspired much during the night.

Repet. Mist. Diaphoret.

28th, Passed a tolerable night, and feels refreshed. Pain of right side easier.

May 2d, Slept well. Complains of return of pain in right side. In other respects feels well. Bowels open. Pulse 100, rather strong.

3d, Slept well. Pain of side easier. Pulse 88,

7th, Convalescent. To have common diet.

Dismissed cured.

## II.

May 30th, 1821.—Anne D——, æt. 17, from Magdalene Asylum. Complains of headache, pain of right side of thorax, preventing free inspiration, with nausea. Bowels regular. Tongue loaded. Pulse 80, soft. Heat 102°.

Was seized yesterday with rigors, headache, and vomiting. Has used no remedies.

Hab. Pulv. Ipecac. ℥j. pro emetico.

Cras mane Sulph. Magn. ℥j.

Lavatio frigida.

31st.—Emetic operated freely, and brought off a considerable quantity of green fluid. No effect from the salts. Slept well. Complains of pain of right side, and is unable to take a full inspiration. Headache easier. Tongue cleaner. Some thirst. Pulse 100, sharp. Heat 98. Skin cool.

Statim Infus. Cathart.

Cont. Lavat. frigida.

ft. V. S. vespere.

*June 1st.*—Was bled last night to  $\frac{3}{4}$ xiv., without relief to pain of side, which still continues severe. Bowels freely moved by the Senna. Tongue white. Considerable thirst. Pulse 104, less strong. Skin warm and moist.

Applic. Vesicat. pectori.

Inhal. vapores aquæ.

Vespere, si symptomat. haud leniora.

ft. V. S.

Rep. Cathart. cras mane.

*2d.*—Blister rose, and discharged well. One copious stool last night, but none to-day. Passed a restless night. Pain of side removed. Tongue nearly clean. Some thirst. Pulse 100. Skin cool.

Rep. Infus. Cathart. c. m.

*3d.*—Senna operated freely. Slept well. Complains of pain of throat, affecting deglutition. Tonsils slightly inflamed. Pulse 120. Skin moist. Tongue nearly clean.

Utat. Mist. Diaphoret.

*5th.*—Improving.

*9th.*—Dismissed cured.

CASES  
OF  
INFANTILE DISEASE,

IN WHICH

EROSIONS AND PERFORATIONS OF THE ALIMEN-  
TARY CANAL WERE FOUND AFTER DEATH ;

WITH REMARKS.

By JOHN GAIRDNER, M. D. Fellow of the Royal College  
of Surgeons, Edinburgh.

*(Read 16th July 1823.)*

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I WISH to draw the attention of the Medico-Chi-  
rurgical Society to some cases of infantile disease,  
to which I cannot find any precisely similar in the  
writings of any British physician, and which were  
chiefly remarkable on account of some very singular  
appearances on dissection. These appearances were  
seated in some part of the stomach, which was found  
either perforated or with its internal coats eroded.  
The perforations appeared to resemble those de-  
scribed by Mr John Hunter, and attributed by him

to the action of the gastric juice after death on the coats of the stomach, which he supposed to be rendered incapable of resisting the digestive power of the fluids generated within it, by the sudden cessation of vitality at a time when the body was healthy, and those fluids in full activity.

I have only seen a few cases of the nature alluded to, and these I shall, without farther preface, proceed to detail.

#### CASE I.

On the 8th of August 1821, I was invited by Mr Bathgate of St James's Street to assist at the examination of the body of a female infant which had been under his care. I had not seen it during life, but I learned from Mr B. the following particulars. It was thirteen months old, and had been troubled with cough from the preceding January. About three weeks before it died, it became very feverish, with a pulse at 160, and breathing about 70 in the minute, but without much heat of the skin, which was frequently colder than natural. It expectorated a great deal of matter with its cough, and had frequent sweatings, which alternated with diarrhœa. This last symptom began three weeks before its death; and about the same period, it became subject to occasional vomiting. Among the matter vomited, there was generally a quantity of the purulent expectoration which had been previously swal-



lowed. The child, during these three weeks, did not lie on the left side, but invariably turned to the other, and a degree of swelling was perceived in the left hypochondrium. For the last ten days it was unable to suck, apparently from debility, but had an insatiable thirst, and drank water and other liquids with eagerness. It slept a great deal, but was easily disturbed, and very fretful, often crying without apparent cause. The matter evacuated from the bowels was of a greenish colour.

*Dissection.* ~~X~~ The lungs were much diseased, and full of tubercles on both sides, and in every part of their substance. Some of these on the left side had suppurated extensively, and burst into the bronchial tubes, which on that side were completely full of pus. A portion of the left lung sunk in water, and the whole of it must have been for some time totally incapable of performing its ordinary functions. The contents of the stomach were effused into the abdominal cavity through a large opening in its left side, at the part where it is in the natural state connected with the spleen. The edges of the opening were ragged, soft, and extremely thin. There was a slightly reddish tinge all round the perforation, forming as it were a narrow border, not so much as a tenth of an inch in breadth. With this exception, there was no appearance either in the stomach or neighbouring parts, indicative of vascular turgescence, or inflammatory action. The opening was so large as to admit four fingers of my right hand.

How long after death?

It is evident, that, in this case, the pulmonary complaint was the primary disease, and that this singular state of the stomach was only accidentally conjoined with it. The child's father died phthisical only six weeks before it. It was nursed by its mother, whose health was good during the time of nursing. In the early months of its life, the child was stout and plump.

The next two cases, which were both fatal, occurred in the same family. In the first, no dissection was made; but I think it worthy of relation, because, after a careful comparison of the histories of these two cases with each other, and with some which I shall afterwards advert to, I now entertain little doubt that the morbid changes in both were similar. This view is strongly confirmed by the probability, that two children, born of the same parents, would possess a similar organization, and would inherit a predisposition, derived from that organization, to similar morbid affections. Both cases, will therefore aid us in establishing the diagnostic marks by which cases of the same kind may in future be known in the living subject.

## CASE II.

This child, a boy, was born on the 1st of July 1819. He throve well while at the breast, and was nursed by his mother, who enjoyed good health, and

had abundance of milk. He was weaned gradually, by withholding the milk through the day, for several days, and was deprived of the breast entirely on the 23d of April 1820, at which time he was 9 months and 22 days old. Two days after, a diarrhœa began. A greenish slimy matter was discharged from the bowels; but the child continued in good spirits for several days after the commencement of this complaint. On the 29th, vomiting was for the first time superadded to it. He appeared softer and thinner, and had a good deal of thirst. The following day, the symptoms appeared progressively increasing in severity. He drank every liquid which was offered to him with great avidity, but vomited both his drink, and almost every thing else that he took. A great degree of languor came on, and increased most alarmingly as the day advanced. He allowed his head, when not supported, to fall back by its own weight, as if unable or unwilling to make any effort to raise it, or to change its position. The eyes were sunk, apparently from absorption of the fat at the bottom of the orbits, and were frequently cast upwards, as if from a sensation of great exhaustion, of which the expression of the countenance was, especially at these times, strongly indicative. The pupil, however, was perfectly contractile; there was no strabismus, and the child seemed quite observant of what was passing around him; but he was listless and indifferent about those to whom he used to be most warmly attached. He frequently fell into a light sleep,

from which he was extremely easily aroused. No unusual heat either about the head or elsewhere. Pulse calm and natural. Dr James Hamilton *junior* saw him about mid-day.

The same symptoms continued, with little variation, till the death of the child, which happened in the evening of the following day, being the ninth day from weaning, the seventh from the commencement of the diarrhœa, and the third from the first occurrence of vomiting. Coldness of the surface and extremities, and a feeble, fluttering, irregular pulse, together with considerable emaciation and extreme weakness, preceded the fatal termination.

I have since greatly regretted that the morbid appearances in this case were not ascertained. Dr Hamilton and I both regarded it as a very severe case of the disease called Weaning Brash, the *Atrophia Ablactatorum* of Dr Cheyne. Rhubarb, mixed with the *Aqua Menthæ piperitæ*, prepared Carbonate of Lime, and Opium, by the mouth and by enema, were the means by which we endeavoured to arrest the rapid progress of the malady.

### CASE III.

This child, a boy, brother of the preceding, was, like him, nursed by his mother, who enjoyed good health, and had a plentiful supply of milk. The child, though by no means robust, had every appearance of thriving, till it was about eight months

old. At this time, it was seized one evening with a fit of violent crying. This occurrence in a child, which was at other times habitually placid and contented, naturally arrested attention; and as the whole family had made arrangements to depart the following day for a distant part of the country, I was consulted with regard to the propriety of undertaking the journey. The child soon after ceased crying, fell into a profound sleep, and awakened the following morning quite well. As they proceeded to the country, I did not see the child for some time; but its mother informed me, that from that period it seemed to her to have a less healthy look; that it frequently had an expression of dissatisfaction depicted in its countenance; and that it was keenly sensible to the slightest impression of cold. I shall not now discuss the question, whether these changes are to be considered as indicating the first approaches of the disease which afterwards proved fatal, or whether they arose simply from the irritation of dentition, though I may state that I incline to the latter opinion.

On the 31st of May 1822, having completed his eleventh month, and got two of his incisores, he was deprived of the breast. On the same day, before the change of food could have had time to produce any impression, he was troubled with a trifling degree of diarrhœa. This complaint went on, but was so slight for a week, as not to make any one uneasy about him, and was treated by regulation of the diet, without medicines.

On the evening of the 8th of June, he had half a grain of calomel, with three grains of the prepared carbonate of lime. This was repeated on the 9th, and operated with considerable power on the bowels. I divided the gums over some of the incisors, which were near to cutting; and on the 10th, the bowel complaint still continuing, he was ordered a powder consisting of eight grains of prepared carbonate of lime, two of rhubarb, and two of Dover's powder.

On the 11th, in consequence of the occurrence of a fit of vomiting, and the continuance of the diarrhœa, he had one-fourth of a grain of opium, made into a draught.

On the 12th, stomach still irritable, but less so than the preceding day; diarrhœa checked in the night, but returned in the morning; no appetite; much thirst. Emaciation and loss of strength now very evident.

A degree of sinking of the eyeball within the orbit had been remarked for a considerable time both by me and by the mother of the child, who, upon my mentioning it, observed that she thought it natural to him. But it was now evidently increased. In other respects the eyes presented no unusual appearance, the pupils were perfectly contractile, and the child quite alive to all external impressions. Pulse natural, as it had been from the first. No heat, either general or local, nor any other febrile symptom. A mixture, consisting of rhubarb and chalk, with a proportion of opium, was directed to be given, in a proper quantity, three times a-day.

14th, Child languid, and exhausted to a very alarming degree; ardent thirst, some retchings, frequent unrefreshing slumbers, from which the slightest touch awakened him.

15th, A number of aphthous specks were observed on the tongue. Stomach less irritable, but incapable of receiving food. The other appearances as formerly.

The specks consisted of a soft matter, which was easily rubbed off. No ulcerations appeared on the surface of the tongue after their removal.

The diarrhoea and emaciation continued progressively to increase till the child sunk from exhaustion. Its death happened on the evening of the 17th, seventeen days from the commencement of diarrhoea, and seven from the first occurrence of vomiting. Nothing happened during the last two days worthy of particular mention, except the appearance of the stools, which consisted of mucus, in large quantity, mixed with a proportion of bile, and on one or two occasions streaked with blood. As the diarrhoea was particularly severe during the two last days, powerful opiates and astringent enemata were unavailingly resorted to.

*Dissection.*—On opening the abdomen the viscera appeared at first sight to be all sound; but on slitting up that part of the omentum which joins the great curvature of the stomach to the transverse arch of the colon, the contents of the stomach were seen pouring out through several perforations in that viscus. These perforations were four in num-

ber; they were situated on the posterior surface of the stomach, not far from its splenic extremity; they were nearly of the same size, the largest scarcely big enough to admit the point of my fore-finger. They were separated from each other by portions of the substance of the stomach, not so broad as the apertures themselves, and these portions were in an exceedingly soft state, and very thin. More of the internal coats appeared to be destroyed than of the peritoneal. No vascular turgescence, no adhesions, nor other marks of inflammation were discoverable. The gall-bladder was full of bile. The intestines appeared thin and semitransparent, partially distended with air, and strongly tinged, in one or two places, by the transudation of bile: they contained scarcely any solid or fluid matter. The liver, mesenteric glands, and all the other viscera of the abdomen, were natural: so, also, were those of the thorax. In short, the disorganization of the stomach constituted the only deviation from the healthy structure. This child was attended during a part of its illness by Dr James Hamilton *junior*. It was also visited by my brother, Dr William Gairdner, who was at that time in Edinburgh, and who saw it along with me almost from the beginning of its illness.

These two cases differ from each other remarkably in regard to the violence of the disease, and the rapidity with which it proved fatal. Case II. ran its whole course in less than half the period oc-



cupied by Case III., and the vomiting, which was incessant for the last three days in the former case, was not a very frequent, nor a very urgent symptom in the latter. Still, the general similarity of the two cases is such, that I think myself justified in classing them as instances of the same disease, varying in the degree of acuteness\*.

#### CASE IV.

While I was preparing this paper the following case occurred.

A female infant, which had been freely purged of the meconium, and which appeared to be doing well, was seized on the 13th day from its birth with a smart feverishness, which continued twenty-four hours, and which was attended with intense heat of the surface. There was no cough, nor vo-

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\* There are two other children belonging to the same family, who were both born before the subjects of the two last cases, and who are both alive. The eldest, a girl, is now, and always has been, remarkably stout and healthy. The other, who is a boy, has always been of a delicate frame, and has had frequent coughs, and other slight illnesses. He was born in May 1817, was weaned 11th April 1818, and was seized seven or eight weeks after weaning with a looseness, which, though not violent, continued to trouble him for several weeks more. Removal to the country during the summer season is always useful to him; and he has been stouter in the course of the last nine or ten months than he ever was for so long a period together in his life.

miting, nor diarrhoea, but a dark green matter was discharged from the bowels. The attack was attributed to the milk, as the mother, who suckled the child, had been feverish the preceding day. After the feverishness was gone the child continued fretful and uneasy, had a tumid abdomen, drank often of gruel, but refused the breast (being apparently incapable of the fatigue of sucking the nipple), rapidly lost strength, and died on the 16th day from birth, the 4th from the beginning of its illness. Repeated doses of scammony were given, and the warm bath was occasionally administered. I had no charge of this child, and scarcely saw it during life. It was attended by Dr Thatcher, who was with the mother in her accouchement, and from him and the relations I have collected the above short history of the symptoms.

*Dissection.*—Happening to be at the time in attendance on another child of the same family, I was invited to be present at the dissection, which I performed in Dr Thatcher's presence. On making an incision at the upper part of the sternum, for the purpose of laying open the cavity of the thorax, a quantity of matter was seen to issue from that part of the thymus gland which projects above the sternum. This was ascertained to have proceeded from the left cavity of the chest. The surface of the left lung was covered with the same matter. Internally the lung was sound. The right lung and the heart were sound also. The intestines contained much flatus, but scarcely any solid or liquid matter.

The stomach was completely distended with fluid. At its splenic extremity, near to the cardia, and on its posterior surface, a part of it appeared almost pellucid, as if the inner coats were dissolved. By everting the stomach this was discovered to be the case, there being at this part nothing remaining but the peritoneal coat, and some few fibres of the muscular. A little farther from the cardia, two other smaller erosions were found presenting similar appearances. All round these erosions the villous coat appeared loose, and detached from the other coats, and had a slightly reddish tinge. With this exception, no signs of unusual vascular turgescence could be discovered. A few thin streaks of dark brown matter were observed in the inner coat of the stomach, but the quantity was so inconsiderable, that I cannot determine whether it was of the nature of the black vomit or not. (See Plate III.)

These four cases are all that I have to produce from my own observation, as illustrative of this very interesting subject. It will easily be believed, that my curiosity was strongly excited, to know if any of a similar description had been recorded in the writings of medical authors, or had occurred in the practice of my medical friends. I accordingly made many inquiries, especially after the occurrence of the first three cases, to ascertain this point; but I found little to my purpose till lately, when some foreign works fell in my way. One of these is entitled, “ Médecine Pratique éclairée par l’Ana-

“tomie et la Physiologie Pathologique, par J. Cruveilhier.” The first number of this work was published at Paris in 1821, and it contains a great many cases quite parallel to those above recorded. From all that I have seen and read on the subject, my persuasion is, that there is a disease primarily affecting the stomach, and sometimes also other parts of the alimentary canal, extremely dangerous in its nature, distinguishable in the living subject by very marked symptoms, and displaying after death the appearances described above; that similar appearances often occur in combination with, or consecutive upon, other severe and dangerous diseases; and that, in the latter case, either there is no disease of the stomach during life, or the character of such disease, if it do exist, is so modified by the other affection with which it is blended, as to render the diagnosis extremely difficult. In the first and fourth cases above related, the changes in the stomach appear to have been consecutive on affections of the chest. The second and third cases seem to me to exhibit the genuine character of the primary affection. To illustrate this character still farther, I shall present the Society with an abridgment of two of Cruveilhier’s cases, in both of which the disease was primary. I select for this purpose the first and fifth cases related by the author. The whole are well worthy of the perusal of all who would wish thoroughly to understand the subject.

## CASE V.

The first of these cases is that of an infant a year old. When Cruveilhier was called, it was evidently moribund. Face discoloured, emaciation carried to the greatest possible extent, pulse imperceptible, extremities cold, sleep interrupted by forcible plaintive cries, insatiable thirst, frequent vomiting of green matter, stools of the same colour still more frequent.

This infant, which had been about a month ill, was seized first with cough, then with diarrhœa, which had not arrested any serious attention till some days before. She died during the night.

*Dissection.*—Splenic extremity of the stomach, and a considerable convolution of the small intestine, converted into a gelatinous transparent matter, without any trace of organization, tearing with the slightest touch. The internal surface of the large intestines strewed with an infinite number of small rounded papulæ (boutons), resembling confluent small-pox. Interstices between the papulæ sound.

## CASE VI.

A boy, aged twenty-two months, who had been weaned at twenty months, had laboured under a diarrhœa with very fetid liquid evacuations for ten days, and had had vomitings for four or five days,

when he was brought to M. Cruveilhier, who prescribed an opiate and a very strict regimen. Two days after, the following state of the symptoms is reported: Countenance much altered; he has a tendency to drowsiness, during which the eyes are imperfectly shut, and are turned upwards; excessive thirst, vomiting every time he drinks; diarrhoea. The gums are red and swelled, and indicate the approach of several teeth.

The following day he is much worse, sleep interrupted by violent cries and sudden movements. He rises to the sitting posture, calls his mother, and falls back on the pillow. He does not ask for drink, but seizes the glass with avidity whenever he observes it.

Next day he appeared to have derived some comfort from the warm bath, which had been directed to be employed night and morning. He had also been ordered to have the breast, which he refused at first, but received after the lapse of twenty-four hours. Notwithstanding this his situation appeared more critical. His eyes were bleared and muddy. His countenance destitute of expression. He let his head fall from side to side, as if by its own weight. He bit the nipple, and pinched strongly every thing near him. Immediately after sucking, his expression was enlivened, he raised his head, and appeared better.

In the night, he was much agitated with violent irregular movements. In the morning his eyes appeared sunk, and insensible to light, his extremities

cold, and his respiration oppressed. He bit the nipple so violently, that the nurse refused to let him have it,—but he still sucked the milk eagerly from a sponge. The abdomen was neither tense nor painful during the whole course of the disease. He died that evening. Death appears to have happened in this case fifteen days after the first occurrence of diarrhœa, and about nine days from that of vomiting.

*Dissection.*—Abdomen tense and voluminous. The stomach, which was collapsed, had a semitransparent appearance. Three-fourths of it towards the left side were soft and gelatinous. This alteration became less and less perceptible, as it approached the pyloric orifice. The stomach did not even contain mucus, and presented no traces of inflammatory congestion.

A liquid of the colour of bistre was found in the duodenum, though the bile in the gall-bladder was of a deep green. Jejunum for the most part contracted,—not a drop of liquid in its cavity. Some curdled milk and greenish mucus in the ileum. Immediately above the Tulpian valve, a considerable quantity of green matter of greater consistence, resembling meconium, had accumulated. A great quantity of greenish liquid, like the matter of the stools, was contained in the great intestine. A degree of redness was observed on the internal surface of the rectum, at the edge of its longitudinal folds,

and on some other points in the course of the great intestine.

The pleura on the inferior lobe of the left lung appeared elevated in the form of a soft jelly. The corresponding part of the lung was sound.

The brain, which had not been examined by the author in any of his previous cases, was perfectly sound in every respect.

The identity of the disease which occurred to Cruveilhier, with that which I have attempted to describe in Cases 2d and 3d, appears to me to be quite established by the many points of close correspondence which exist between them. Diarrhœa, green liquid stools, with great thirst and gradual loss of strength, but without increased heat of the body, or increased rapidity of the circulation,—vomiting,—a state of somnolency frequently occurring, during which the eyes are partially open, and from which the slightest touch awakes the infant,—perfect mental acuteness,—progressive and rapidly increasing debility,—and immediately before death cold extremities, profuse sweatings, and a fluttering, unequal rapid pulse,—these symptoms, which occur pretty nearly in the above order, constitute a character of disease which will not be readily mistaken by an attentive practitioner, and in every one of them the observations of the French physician agree exactly with mine. I did not indeed observe in my cases the violent crying and sudden movements as if from tormina, which are uniformly men-



tioned in those of Cruveilhier, but in every thing else, the symptoms are quite alike.

The appearances found on dissection, afford another point of comparison. In the two cases quoted from Cruveilhier, the coats of the stomach were converted into a soft gelatinous substance, but not perforated. There is, however, no want of correspondence here, for these two cases are only examples of the same changes of structure in a different stage of their progress. These changes, as they presented themselves to our author, will be best understood by quoting his own words\* : “ Les perforations  
“ spontanées *aiguës* sont toujours précédées d’un  
“ ramollissement gélatiniforme avec épaissement  
“ des parois de l’organe. Elles peuvent avoir lieu  
“ dans les intestins grêles et gros, aussi bien que  
“ dans l’estomac ; on les a observées jusques dans  
“ l’œsophage. Le ramollissement gélatiniforme pro-  
“ cède toujours de l’intérieur vers l’extérieur. Il y  
“ a d’abord simple écartement des fibres que sépare  
“ un mucus gélatineux ; bientôt les fibres elles-  
“ mêmes sont envahies, deviennent demi-transpa-  
“ rentes, disparaissent enfin, de telle sorte que l’esto-  
“ mac ou l’intestin ramollis ressemblent à de la gé-  
“ latine transparente, arrondie en tube ou en por-  
“ tion de tube. Si la désorganisation gélatiniforme  
“ est complète, les parties désorganisées sont en-  
“ traînées peu à peu, et ce qui reste paraît aminci.

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\* Page 116. of his work, above quoted.

“ Dans tous les cas de perforation de l'estomac ou  
 “ des intestins, suite de cette altération, la partie  
 “ altérée et le voisinage ne présentent ni change-  
 “ ment de couleur, ni injection de vaisseaux, ni odeur  
 “ de gangrène.”

He gives several cases in which large portions of the alimentary canal had undergone this singular change. In one of the most remarkable of these \*, the three inner coats of the stomach at the splenic extremity were in a gelatinous state; so also were the cæcum, the ascending, and one-half of the descending colon. Even the longitudinal bands at these parts were entirely gelatinous. Liquid fæces were effused in the right lumbar region, which had escaped by a perforation in the ascending colon. Similar liquid was forced by gentle compression from an opening in the descending colon. The whole extent of the great intestine was studded on its internal surface with an eruption of papulæ similar to those which occurred in the 5th case related above †, each having a depression in the centre, and the whole eruption strongly resembling confluent small-pox. The small intestines exhibited an eruption possessed of the same general character.

This disease has also fallen under the notice of Dr Jaeger, Physician to the Court of Wirtemberg, who has given the result of his observations to the

\* Observation 4.

† The first of Cruveilhier's Cases.

public, in two Numbers of Hufeland's Journal \*. A very distinct account of Dr Jaeger's experience, (which, I believe, is the only statement of it in the English language), has been inserted by Dr Gumprecht in the London Medical Repository †. Some notice of Dr Jaeger's Observations is also to be found in a Thesis, published at Tubingen in 1818 by Dr Zeller ‡. Here, again, we find the identity of the disease above described, with that witnessed by Dr Jaeger, sufficiently ascertained, by their agreement in many important particulars :—in the age of the infants, which was from four to eighteen months,—in the violent thirst, loss of appetite, diarrhoea, and vomiting,—in the uneasiness and restlessness, alternating with a disposition to lie dozing with half-shut eyes,—in the paleness and change of expression in the countenance,—in the exhaustion and emaciation,—in the fluttering pulse, cold extremities, and fatal result,—and, lastly, in the appearances developed by the examination of the body after death. The course of the disease was in general rapid. In one case it was fatal in a

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\* Those for 1811 and 1813.

† Vol. x. p. 416. Some account of it has also been published in French by M. Broussais, in his *Examen des Doctrines Medicales et des Systemes de Nosologie*, tom. 1er, p. 203—207.

‡ Its title is as follows : “ *Dissertatio inauguralis de Natura Morbi Ventriculum Infantum perforantis.*” It contains a good deal of theoretical discussion, and some original cases of perforation of the Stomach.

few hours. In two others it had a more chronic form, but proved fatal in the course of from four to six weeks. The disease was ushered in by smart feverishness, and attended, in its earlier stages, by cries and movements indicative of pain. In both of these particulars, Dr Jaeger's observation differs from mine. In the first of them it also differs from the majority of Cruveilhier's cases. But every disease is liable to have its character varied by the circumstances in which it originates. From the remarks of Dr Zeller, in the beginning of his thesis, it appears that this disease had prevailed endemically in Stuttgard, and some other places. Cruveilhier asserts that it was endemic in his practice in the months of August, September, and October 1819, a time when diarrhœas and intermittents were very prevalent, and adduces some cases in which it began with the symptoms of intermittent fever\*. In one case, it appears to have followed as a consequence of scarlatina †. In some others it was connected with worms in the intestinal canal ‡. From all these combinations, the disease must necessarily have received considerable modification.

The splenic extremity of the stomach, near to the vasa brevia, was the usual seat of the disorganization found in Dr Jaeger's dissections. It was fre-

\* Cruveilhier, Observations 12. and 13.

† Ibid. Observation 6.

‡ Ibid. Observations 7, 9.

quently perforated, and the contents were in that case poured out between the stomach and pancreas. At other times the inner tunics were destroyed, while the peritoneal remained entire. In one case a portion of the ileum, at its lowest part, was in this state.

The internal coats were sometimes reddish at the affected parts, but there was never any appearance of actual inflammation. The edges of the perforated parts were surrounded with unequal fringes. A part of the œsophagus, about the middle of the chest, had in one case undergone this species of solution, and the destructive action had penetrated into the substance of the lungs; a little lower down the œsophagus was natural, and under the cardia the solution appeared again. In a case where the contents of the stomach had escaped, there was partial corrosion of the peritoneal coat of the diaphragm, and softening of its muscular fibres; and one spot of the paries anterior abdominis, corresponding to the anterior part of the fundus, was changed in the same manner.

There is a case reported by M. Gistren, in a Swedish publication, of which I find a very brief abstract in the *Journal de Medecine* \*. The subject was a child, and there was found in the stomach an aperture with very thin edges, by which the contents of that viscus escaped into the abdominal cavity. There was neither inflammation nor gan-

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\* Janvier 1813.

grene, and the course of the disease was very rapid.

Mr Burns mentions\* four instances which occurred to him in dissection, in which the whole alimentary canal, from the cardia to the beginning of the rectum, was dissolved into a pulpy glutinous mass, every part of it being so soft as to tear with the slightest touch. They were young children, and nothing was known of their history during life. No other morbid appearances were found to account for their death. They all occurred in summer. As they appear to be allied to my subject, I have thought proper thus shortly to notice them.

Although there may be some reason to suspect that the disease above described is apt to be excited by weaning, yet it is certainly not always the consequence of that change of food. It sometimes occurs while the child is at the breast, and sometimes long after. It is probable that it is occasionally produced by the bad health of the nurse; and, as we have already seen, it may follow in the train of eruptive and other diseases.

I have endeavoured to illustrate some particulars regarding the disease, by the results of a number of cases, reduced to a tabular form. Those cases were selected in which these particulars were most accurately noted. One column is devoted to the ages, one to the sexes of the patients; one to the time

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\* Edinburgh Med. and Surg. Journal, vol. vi. p. 137,

which elapsed between the weaning of the child and the first symptoms of the malady ; one to the duration of the disease, from the first symptoms to the death of the patient ; one to its duration from the accession of vomiting till death ; and one to the morbid appearances. The plan of this Table of course excludes all those cases in which the disease is supposed to have occurred, and which ended favourably.

Since the paper was read, I have been enabled to enrich the Table with additional cases. One of these (No. 15.) will be found at full length in the Appendix, No. II. The others are from German authors. Cases of this description appear to have been much attended to in Germany, since the publication of Jaeger's Essays.

In some of the cases in the following list (as in Nos. 8. and 13.), it may seem at first view, that death had been produced by other causes than the disease of the alimentary canal. Be this as it may, a sufficient body of evidence will remain, after all doubtful cases have been excluded, to prove the existence of a separate disease of that canal, of which the appearances described in the Table are the ultimate results.

TABLE I.

No.	Age.	Sex.	Whether the disease began after or before weaning, and if after, how long.	Duration from beginning of the symptoms till death.	Duration from the commencement of the acute symptoms, and especially of vomiting, till death.	Authority on which the case rests.	Appearances after Death; with other Miscellaneous nature.
1.	9 m. 24 d.	Male.	2 days.	7 days.	3 days nearly.	The Author, see above, p. 314.	Fatal; no dissection.
2.	11 mos.	Male.	Same day.	17 days.	7 days.	The Author, see p. 316.	Perforation of stomach in four contiguous spots; no other morbid appearance.
3.	11 mos.	Female.	Not noticed.	1 month.	Not noted.	Cruveilhier's 1st case; the 5th stated in my paper, see p. 325.	Gelatinous state of the splenic end of the stomach, and of a considerable part of the small intestine. Eruption on internal surface of the great intestine.
4.	11 mos.	Male.	2 months.	13 days.	3 days.	Cruveilhier's 2d case.	Gelatinous state of the splenic extremity of the stomach, and of several inches of the small intestine.
5.	12½ mos.	Female.	2 weeks.	6 weeks.	6 days.	Cruveilhier's 3d case.	Splenic extremity of stomach gelatinous. Small gut full of fluid. On its inner surface were a number of dense, whitish, elliptical spots. Its internal membrane was easily separated, except in the situation of these spots, where it adhered very strongly.
6.	2½ years.	Male.	15 months.	32 days.	12 days.	Cruveilhier's 4th case. See some particulars of it at p. 330.	The three internal coats of stomach at its splenic end gelatinous. A large portion of great intestine in a similar state, which was perforated in two places; partial effusion of its contents. Intestinal eruption as in No. 3. and dense spots as in No. 5.



8.	17 mos.	Female.	2 months.	Not noted.	Not accurately noted. Severe symptoms began 5 or 6 days before death.	Cruveilhier's 6th case.	Posterior part of stomach to the left of the cardia translucent; its three internal coats soft and gelatinous. Large portion of the colon in a similar state, with parietes of double the natural thickness, and with eruption as in Nos. 3. and 6. This case was complicated with an abscess in the left lung; but it had the same train of symptoms as the preceding cases; and these occurred after the child had recently passed through scarlatina.
9.	16½ mos.		2 weeks.	11 days.	5 days.	Cruveilhier's 7th case.	Fatal. No dissection. Forty worms discharged by the mouth and nose, and by stool. The child's appetite, naturally voracious, had been too freely indulged by the parents.
10.	13 mos.		1 week.	46 days.	18 days.	Cruveilhier's 11th case.	Disease began with fever and looseness. Fatal. No dissection. The usual symptoms present.
11.	5 months.	Male.	Disease occurred before weaning.	Child died the evening of the 2d day.	Vomiting occurred first on the day of its death.	Dr Jaeger of Stutgard, in a paper in Hufeland's Journal, 1813, on softening of stomach and intestinal canal. Dr J.'s 1st case.	The part of the stomach to the left of the cardia converted into a thick, reddish-grey, translucent, gelatinous substance, which tore easily. Some vestiges of the muscular coat remained; the peritoneal was sound, no inflammation. Distinct line of demarcation observed between the altered and sound parts. Considerable vascularity of brain. No emaciation. This and the rest of Dr Jaeger's cases were all attended with fever.
12.	5 weeks.	Male.	Disease occurred before weaning.	6 days.	6 days. Vomiting occurred from the first.	As above, No. 11. Dr Jaeger's 2d case.	Villous and middle coats of the stomach at its fundus, and from thence towards its middle, easily separable from the peritoneal, which was sound. They were also thickened, and soft in their texture, and the villous was of a bright rose-red colour.

TABLE I.—continued.

No.	Age.	Sex.	Whether the disease began after or before weaning, and if after, how long.	Duration from beginning of the symptoms till death.	Duration from the commencement of the acute symptoms, and especially of vomiting, till death.	Authority on which the case rests.	Appearances after death; with other Remarks of a Miscellaneous nature.
13.	27 weeks.	Male.	After weaning; how long is not noted.		5 days from the first vomiting.	As above, No. 11. Dr Jaeger's 3d case.	Stomach contained a dark fluid, of an acid nature. Its left half had undergone changes similar to those mentioned in Nos. 11. and 12. The part in contact with the spleen of a deep red externally, and of a dark colour internally. Red line of separation between altered and sound parts. Brain exhibited an appearance of increased vascularity; ventricles contained more fluid than natural.
14.	9 weeks.	Female.	Before weaning.		5 days after the commencement of the acute symptoms. No vomiting in this case.	As above, No. 11. Dr Jaeger's 6th case.	Stomach and duodenum empty, contracted and healthy. Small intestines distended with air; large intestines, partly with air, and partly with a dirty brown fluid, of an acid nature. Several small lacinations of the ascending colon, and of the transverse arch of the colon, which gave passage to its contents. Internal coats at these parts gelatinous. This change was most complete in the mucous coat, and became gradually less in those external to it. Some vascularity of the membranes of the brain. Mesenteric glands swelled, not indurated.
15.	10 mos.	Male.	Before weaning.	Upwards of a fortnight.		Dr Alison, Professor of Theory of Physic in the University of Edinburgh. See Appendix, No. 2.	Extensive opening in the splenic end of the stomach, with gelatinous, translucent borders, and effusion of contents of the stomach, between it and the spleen. Peritoneum red in the situation of this effusion. Vascularity of right lobe of the liver, with adhesion to adjacent peritoneum. Incipient tubercles in the spleen, and gelatinous effusion firmly adhering

16.	8 months.	Not noted.	After: how long, not noted.	16 days.	9 days.	Dr F. Rhades in Horn's Archiv. Sept. and Oct. 1822, p. 233.	Some serum between dura mater and arachnoid. No fluid in the ventricles. Stomach softened and perforated at the splenic extremity.
17.	7½ mos.	Not noted.	Before.	14 weeks.	Not noted.	As in No. 16. p. 241.	Brain and meninges as in No. 16. Perforation of stomach larger.
18.	9 months.	Male.	Not noted.	4 days.	Not noted.	Fleischmann, Leichencaffinogen, p. 122.	Stomach gelatinous, and perforated; contents effused about the spleen.
19.	6 months.	Male.	Fed on spoon meat from birth.	7 days.	Not noted.	As in No. 18. p. 122.	Stomach about the middle of its posterior surface soft, and easily torn; not perforated.
20.	17 mos.	Male.	Not noted.	5 days.	1 day.	As in No. 18. p. 123.	Posterior surface of stomach, towards the fundus, changed as in No. 19.
21.	9 months.	Male.	After: how long, not noted.	8 weeks.		As in No. 18. p. 124.	Left half of stomach softened as in No. 19., chiefly posteriorly. Similar softening of lower end of duodenum—of 10 or 12 inches of jejunum—and of part of the mesentery. Mesenteric glands enlarged.

I have already remarked, that, besides those perforations which are the result of a primary morbid affection of the alimentary canal, there are others on record, which have been discovered in the bodies of persons who have died of other diseases. As the perforations in these cases exactly resemble those which occur in the former class, and as the circumstances with which they are attended will throw some light on the theory of both, I have collected, from different sources, a number of such cases, whose results I have reduced to a tabular form. In this Table, the age and sex of each subject are noted,—another column contains a reference to the work in which each case is detailed,—another contains some account of the state of the alimentary canal,—and another of the diseases which appeared to have caused death. I have been careful to exclude from my list all cases of perforations with indurated edges, regarding these as belonging to a distinct class. I have also thought proper to omit all those cases in which the perforated part of the alimentary canal adhered to the adjoining viscera, and have restricted myself to those cases in which there was no suspicion either of scirrhus or of ulceration. These perforations appear to have been generally quite unsuspected during life. From the results of the cases which I have collected, it would seem that they are liable to occur in pneumonic, phthisical, apoplectic, and hydrocephalic\* cases, and in continued fe-

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\* My friend Mr Shaw informs me, that there are several specimens of perforated stomachs, taken from the bodies of hy-

ver \*, puerperal peritonitis, and puerperal convulsions.

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drocephalic children, in Mr C. Bell's museum at Great Windmill Street, London, which has been for many years under the care of Mr S.

Though softening and perforation of the stomach appear to be frequent concomitants of acute hydrocephalus, yet we are assured by Jaeger, that, in a considerable number of children who died of that disease, he found the stomach sound and unimpaired.

\* A case of continued fever, attended with solution of coats of the stomach, has been reported to me by Dr Home, Professor of Practice of Physic in this University, but I have not been able to procure the notes of it. The case occurred in the Clinical Ward of the Royal Infirmary.

TABLE II.

No.	Age.	Sex.	By whom and where recorded.	State of the Alimentary Canal.	Other Diseases.
1.	13 months.	Female.	In the above paper, Case 1st.	Complete solution of splenic extremity of stomach. Contents effused.	Extensive suppuration of lungs, accompanied with all the usual symptoms.
2.	13 days.	Female.	In the above paper, Case 4th.	Solution of the three inner coats of stomach peritoneal entire. Stomach full of fluids.	Effusion of purulent fluid on surface of left lung.
3.	9 years.	Female.	Dr Jaeger, Hufeland's Journ. 1811, No. 5. p. 18.	Solution of the coats of the stomach.	"Died of a sickness very nearly related to an acute hydrocephalus."
4.	A child.		Ditto, p. 13.	Ditto.	Acute hydrocephalus.
5.	Young, but an adult.	Male.	Ditto, p. 20.	Ditto.	Serum under the arachnoid coat. Patient died of violent peri-pneumony 5th day of the disease.
6.	Elderly.	Male.	Ditto, p. 20.	Ditto.	Violent hæmoptysis, with inflammation of the lungs.
7.	5½ years.	Female.	Zeller's Thesis quoted above (see page 331. of this essay), pages 7 and 8.	Perforation of stomach of the size of the fist near to the cardia. Contents effused.	Effusion of blood within the cerebral substance, and of water in the ventricles and at the base of the brain. Symptoms indicated cerebral determination. Mesenteric glands large.
8.	2 years.	Female.	Ditto, pages 18. 19. 20.	Perforation in the fundus of the stomach. Margins gelatinous and soft. Rest of the stomach inflamed.	Great fulness of vessels in the meninges of the brain. Water in the ventricles. Mesenteric glands swelled.
9.	8 months.	Male.	Ditto, pages 20. 21.	Posterior part of the fundus of the stomach soft, gelatinous, and perforated.	Effusion of 5 oz. of water between the meninges of the brain.

10.	Adult.	Female.	Laisné, Considerations Medico-legales sur les Erosions et Perforations de l'Estomac, p. 163. This and the next six cases may also be found in the <i>Dictionnaire des Sciences Medicales</i> , under the title "Perforation."	Perforation of 3 inches length in the stomach; edges thin, soft, in contact with, but not adhering to the diaphragm, in which there was a corresponding perforation 2 inches long, with fringed borders, dark coloured. No effusion of contents of stomach into the abdomen; a little into the thorax.	The woman died from convulsions, which occasioned premature labour. She was delivered of two dead children, and died some hours after.
11.	Adult.	Female.	Laisné, p. 164.	Perforation of the œsophagus, with soft, pulpy, blackish edges, very thin; effusion of brownish matter into the left pleura.	Died of peritonitis some days after delivery.
12.	Adult.	Female.	Ditto, p. 164. 165. 166.	Perforation of the œsophagus and mediastinum opposite; escape of brownish liquid into the left cavity of the thorax. Corrosion of the left pleura; denudation of the lung.	Also a puerperal case. Died the 7th day from delivery, with all the usual indications of peritonitis, the existence of which was fully proved by the appearance of the peritoneum.
13.	Adult.	Female.	Ditto, p. 166. 167. 168.	A large opening in the stomach, with thin, pulpy, brownish borders, bathed in a brown, viscid, inodorous fluid. Diaphragm and liver discoloured and softened near to the perforation.	Redness of the pleura and peritoneum; puriform fluid in the thorax, and extensive effusion in abdomen. Woman died the 19th day after delivery, with all the signs of violent inflammation.
14.	Adult.	Female.	Ditto, p. 168. 169.	Large perforation of stomach at splenic end, of the whole breadth of that extremity; borders thin, soft, brownish; diaphragm stripped of its peritoneum. All these parts bathed in a brownish, viscid fluid.	Seized with peritonitis 2d day after delivery, the ordinary appearances of which were visible on dissection, besides effusion into the ventricles of the brain, into the thorax and pericardium.

No.	Age.	Sex.	By whom and where recorded.	State of Alimentary Canal.	Other Diseases.
15.	11 years.	Male.	Laisné, above cited, p. 169. 170. 171.	Large perforation of the stomach at the left end; borders thin and soft; 4 or 5 oz. of viscid, brownish fluid effused about the diaphragm and spleen, which were both stripped of their peritoneal coat.	Died of alternate convulsions and coma. Great vascularity of the meninges, and effusion of blood within the brain, compressing the second and third pairs of nerves.
16.	3 years.	Male.	Ditto, p. 171.	Stomach perforated at one part; its internal coat destroyed at another: thin and soft at both places. Part of the omentum destroyed; liver stripped of peritoneal coat. Both omentum and liver bathed in the fluid which had escaped from the stomach.	Pneumonia; fatal in three days. Usual appearances observed on dissection of the lungs.
17.	Under 20.	Male.	John Haviland, M.D. Professor of Physic at Cambridge, in the Cambridge Philosophical Trans. vol. i. part 2d, p. 287.	Two large perforations in posterior surface of the stomach; and an opening in the diaphragm corresponding to one of them. Contents of the stomach poured into the chest. Various erosions of the inner coat of the stomach, which was unusually red and vascular.	Died of fever, with signs of cerebral determination. Vascularity of pia mater. 12 or 14 drachms of serum in the ventricles.
18.	1½ years.	Female.	Dr Jaeger of Stuttgart, in Hufeland's Journal or the year 1813. Dr J.'s 4th case.	To the left of the cardia, the coats of the stomach had undergone the same change described in Nos. 11. and 12. of the former Table. The peritoneal was not affected, except at one spot where it was easily torn. Part of the muscular substance of the diaphragm, where it was in contact with the stomach, was converted into a gelatinous substance: the inferior portion of the œsophagus, with the mediastinum in contact with it on the left side, had undergone the same change. Part of contents of stomach had escaped through an aperture in the œsophagus into the cavity of the chest. The whole surface of the mucous coat of the large intestine was soft and easily separated.	Great vascularity of the meninges. Some fluid between the arachnoid and pia mater. Lateral ventricles contained each about 2 oz. of serum. Considerable inflammation in the thorax. The disease of which the child died was probably the hydrocephalus. The duration of the case was nine days.



19.	15 months.	Female.	As above, No. 18. Dr Jaeger's 5th case.	<p>Stomach and intestines distended with air. Coats of the stomach gave way on being gently pressed on the posterior surface near to the pylorus. Great part both of the anterior and posterior parietes of the stomach discoloured externally, and converted internally into a gelatinous substance. The part in contact with the spleen, also the cardia and pylorus, natural. Line separating the natural and disorganized parts was well marked. Peritoneal covering of the diaphragm gelatinous.</p>	<p>Serous effusion found under the tunica arachnoidea. Ventricles of the brain contained a large quantity of serum. Marks of inflammation in the chest. Death probably was the effect of the hydrocephalic affection. The illness lasted seven days.</p>
20.	40 years.	Female.	Creveilhier's 31st case.	<p>Gelatinous state of the great extremity of the stomach.</p>	<p>Extensive tubercular disease in the lungs, with large irregular ulcerated cavities.</p>
21.	Not noted.	Not noted.	Cruveilhier's 32d case.	<p>Splenic extremity of the stomach gelatinous and perforated. Contents of stomach effused near that extremity.</p>	<p>Patient died of pneumonia after 8 days illness. Hepatization of the whole of the right lung.</p>
22.	22 years.	Male.	Cruveilhier's 33d case.	<p>Gelatinous state of the splenic extremity of the stomach.</p>	<p>Tubercular disease of lungs; extensive cavities in the right lung.</p>
23.	11 mos.	Not noted.	Dr F. Rhades, in Horn's Archiv. Sept. and Oct. 1822, p. 226.	<p>Gelatinous state of part of cesophagus and fundus of stomach, the latter perforated; contents effused in vicinity; distinct line of separation between the gelatinous and sound parts; pancreas partially softened.</p>	<p>Symptoms indicated a pneumonic affection. Hepatization of a small portion of left lung. Some serum between the dura mater and arachnoid; small quantity also in the ventricles. No vascularity of brain or meninges.</p>

In regard to the theory of this disease, it seems to me pretty evident, that the erosions and perforations described above do not arise from ulceration, for they are found either without any indications of vascular action, or with only some slight redness of the villous coat, such as has been proved by Dr Yelloly\* to be consistent with the most healthy state of the stomach. Besides, there is no pus formed, nor any adhesion of the perforated viscus to the neighbouring parts; and the edges of the opening, instead of being granular, are ragged and fringed. It is also clear, that a large opening, such as occurred in Case 1st, if it really proceeded from ulceration, must have been in existence for a considerable time, during which the contents of the stomach or bowel, effused into the cavity of the peritoneum, must have excited extensive inflammation over all that membrane. A case is mentioned by Dr Zeller†, in which there was a perforation in the stomach of the size of the fist, and in which a purgative anthelmintic brought away sixteen lumbrici the day before death. Had the perforation existed at this time, the medicine must have passed into the cavity of the peritoneum.

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\* Observations on the Vascular Appearance of the Human Stomach, which is frequently mistaken for inflammation of that organ, by John Yelloly, M. D. 4th Volume of the Transactions of the Medical and Chirurgical Society of London, page 371.

† P. 4. to 10. of thesis above cited.

The total absence of inflammation of the peritoneal surface, at those parts where it is in contact with the effused fluids \*, seems to me an absolute proof that the perforation does not occur during life. I therefore adopt the Hunterian theory, and ascribe these perforations to the solvent action of the liquids of the alimentary canal after death. Mr Hunter mentions having seen such appearances in the stomach only ; but the extension of his theory to phenomena precisely similar, occurring in the other situations already described, appears to me fair and legitimate. The presence of such appearances in some cases, and their absence in others, may depend on variations in the quantity and quality of the contained fluids, and also on peculiar states of the containing parts, which render them of more or less easy solubility.

The peculiar softening of the coats of the stomach and bowels, which occurs in the infantile disease above described, appears to render them a more easy prey to the digestive power of their own fluids : yet we have seen, that, even in this gelatinous state, the canal is sometimes found entire †, which can only be explained by the supposition of a deficiency ei-

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\* See a case illustrating this fact in Cruveilhier, *Observ.* 4. His remarks at bottom of page 45. are deserving of attention.

† See many of the cases quoted in the first of the two Tables given above.

ther in the quantity \*, or in the solvent power of its contents. This softening from infiltration of fluids between the coats, which is so well described by Cruveilhier, in the passage above cited †, in truth, constitutes the only real disease of the alimentary canal in these cases ; since those cannot be called *morbid* appearances which are not produced during life.

As the truth of the Hunterian theory has sometimes been questioned, and as many proofs of it may be adduced in addition to those stated by its ingenious author, it seems to me not out of place to give a summary of the evidence by which it is supported. The arguments which I have already employed to disprove the supposition that these openings arise from ulcerations, are so many negative proofs of the accuracy of the Hunterian hypothesis. The other arguments may be arranged as follows—

1. The human stomach has been found perforated in persons who have died a violent death, without

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\* See Case 6th, related above, in which the stomach was empty, and in which, though reduced to a gelatinous state, it was not dissolved. It is probable that the gastric fluid is secreted like the saliva, only when the reception of food into the stomach renders its secretion necessary to the process of digestion. In proof of this, I may mention, that all the eroded and perforated stomachs, human and comparative, which have fallen under my observation, contained some portion of alimentary matter.

† See page 329. above.

previous illness, and in whom, therefore, it is to be presumed that no such important lesion of a vital organ had existed prior to death. I need scarcely add, that this statement rests on the authority of Mr John Hunter \*, who mentions three cases of perforation of the splenic extremity of the stomach, in two of which death was produced by injury of the head, and in the other by strangulation.

2. Similar observations corroborating this inference have been made on the stomachs of the inferior animals ;—on those of fishes, by Hunter, Spallanzani †, and Dr Joseph Adams,—on those of rabbits, by the latter, and also by Sir Astley Cooper and Mr Carlisle ‡,—and on that of a dog, by Dr Adams †. In all these cases the animals were previously healthy, as far as could be ascertained, and were put to death by violence. I have myself witnessed similar appearances §.

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\* Observations on certain parts of the Animal Œconomy, by John Hunter, 2d edit. pages 226.—231.

† Spallanzani on the Natural History of Animals and Vegetables, Dissert. 5.

‡ Adams on Morbid Poisons, Preliminary Remarks.

§ The stomach of a Rat was exhibited to the Society, having the internal coat digested. It was killed by blows chiefly on the head, and was opened several days after, but before any putrefaction had taken place. About one-third of the internal coat, towards the pyloric orifice, remained entire. The stomach was completely distended with the garbage on which the animal lives. I have seen the same appearances in rabbits.

3. In cases in which a perforation of the alimentary canal has occurred, erosions of the surfaces of the adjoining viscera, softening and partial solution of their substance, erosions of the abdominal parietes, and erosions and perforations of the diaphragm, with effusion of the contents of the stomach through such perforations into the cavity of the thorax, have all been occasionally met with. No symptoms have been observed in such cases from which any injury of these important parts could have been surmised. Appearances of this description are mentioned in Mr Hunter's work above cited,—two instances have already been quoted from Jaeger, and similar facts are recorded by Professor Chaussier \*, Mr Allan Burns †, and more recently by Professor Haviland of Cambridge ‡.

4th, In the stomach of a fish, which was perforated at one extremity, Dr Adams § found a smaller fish partially digested, and a live worm quite entire. The worm was killed, and after having been a few hours re-immersed in the fluids of the stomach, was found “more than half digested.”

5th, The theory derives further support from the cases already adverted to, of perforations of the

\* See the Puerperal Cases quoted from Laisné's Book, in the 2d Table given above.

† Medical and Surgical Journal, vol. vi. p. 135.

‡ As quoted in the 2d Table, No. 17.

§ In the place cited above. The fish he opened was a John Dory.

stomach and bowels in the bodies of persons who have died of other diseases; since it is not easy to explain why any disease of the stomach or bowels should effect such extensive destruction, simultaneously with pneumonia, apoplexy, or convulsions, and *that* without exhibiting any symptoms calculated to excite suspicion of its presence.

6th, Mr Allan Burns of Glasgow\*, after exhibiting to his pupils a perforation of the stomach, and pointing out to them that the liver was sound, replaced the parts *in situ*, and sewed up the body. On opening it after two days, he found that the peritoneal coat of the liver opposite to the opening in the stomach, was completely dissolved, and that the liver itself was tender to a considerable depth.

I wish that I were able, from the preceding history, to derive those principles by which our practice ought to be guided. I have endeavoured to point out, from my own experience and that of others, the diagnostic marks by which a very fatal infantile disease may be known in the earlier stages of its progress. In so far as this has been done correctly, it will form a foundation for accurate remarks on the effects of remedies in future. Cruveilhier is of opinion that the disease is occasionally cured, and I think I have seen some cases tending to confirm this position. When a cure is obtained

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\* Edinburgh Medical and Surgical Journal, as cited above.

it is after a very tedious illness \*, and even when the disease has been completely banished, it is long before the child recovers the strength and firmness of which he has been deprived †.

Notwithstanding the absence of every appearance of vascularity of the stomach in many instances of this disease, it is evident that some degree of vascular action must attend its commencement, since it is hardly possible to account for the effusion of fluids between the coats of the stomach and intestines by any other hypothesis. I would therefore propose, if the child is tolerably stout, to abstract blood ‡ in this stage, and I should be disposed to apply a blister over the epigastrium, with a view to abate the local determination towards the vessels of the stomach. Both these remedies should evidently be applied *as early* as possible. Cruveilhier employed blisters, but applied them to the inside of the thighs, and they do not appear to have done any good. There are two other remedies, from both of which I have seen some benefit, or at least some temporary

\* Cruveilhier, Observation 8.

† See above, p. 321., Note.

‡ If the disease occur totally without fever and without pain, as in cases 2d and 3d, it may be doubtful whether this active and powerful remedy ought to be employed. But I should be disposed to use it in cases attended with tormina, like those related by Cruveilhier or Jaeger; and in cases attended with fever like those related by the latter. Future experience can alone determine the propriety of this practice, and the extent to which it may be carried.



alleviation. I mean opiate enemata, and the warm bath. The former tend to check the diarrhoea, and they have both considerable influence in diminishing irritation. I should be disposed to avoid throwing into the stomach any food or drink calculated to irritate, either by its nature or by its quantity; and I should particularly avoid medicines of almost every description, but especially those of a purgative nature. They must necessarily produce action in the diseased and tender parts of the alimentary canal, and they are not needed, for dissection shews that the bowels are, in these cases, found unusually empty. Cruveilhier proposes, with a view to keep the whole canal free from irritation, to give the food and drink in very small quantities, and at long intervals, and to increase the quantities and diminish the intervals cautiously as the vomiting and diarrhoea abate. This treatment he supports by some strong cases, shewing the advantage of pursuing it, and the mischief immediately ensuing on the adoption of an opposite course. If there be any suspicion that the disease has been produced by weaning, endeavours should of course be made to get the child to return to the breast, which it should be permitted to suck only for a short time once in three or four hours.

Long nursing, and great attention to the health of the nurse, are advisable in families in which a tendency to the disease has shewn itself.

There is a topic of great practical importance, to which I have not at all adverted. I mean the ap-

plication of the facts above stated, to the judicial examination of dead bodies in cases where poison is suspected. But as I can add nothing regarding this matter, that is not in itself obviously deducible by every well informed physician, from what I have already detailed, I shall content myself with thus simply noticing a subject, the deep importance of which, as involving the safety of the innocent, and the interests of society at large, might seem at first sight to demand some lengthened animadversion.

## APPENDIX.

## No. I.

IT has occurred to me, since reading the above paper to the Society, that it may be useful to give a connected summary statement of the propositions which I have endeavoured to support. These are as follows :

1. That erosions and perforations of the stomach, and of other parts of the alimentary canal, which do not appear to be effected by ulceration, are frequently found in the bodies of infants, whose symptoms during life would not lead any one to suspect disease of that canal ; but who appear, both from the indications during life, and from the phenomena on dissection, to be the victims of other diseases, and of those in particular which are mentioned in Table 2d.

2. That similar erosions and perforations are found in the bodies of infants, whose death is the result of a peculiar disease, distinguishable in the living subject by very marked symptoms \*, which are such as to suggest to the mind of the practitioner the idea that the alimentary canal is the seat of the affection.

3. That in both these descriptions of cases, the erosions and perforations are produced by the action of the fluids of the alimentary canal after death †.

4. That in cases of the first description, it is probable that the erosion often happens without any previous dis-

\* See p. 328. and 331.

† See p. 346, 347, 348.

ease of the eroded parts ; but that in cases of the second class, there does appear to be sufficient evidence of the existence of certain organic changes in the living subject, by which some portion of the alimentary canal is so altered, as to be rendered more easily soluble after death by the action of its contents\*.

5. That erosion after death does not always follow this morbid alteration †, a circumstance probably to be imputed to a deficiency in the quantity or solvent power of the contained fluids.

## No. II.

WHEN part of the preceding paper had been printed, my friend Dr Alison, Professor of the Institutes of Medicine in this University, transmitted to me the following notes of a case which he had been attending.

*“ 27th August 1823.*

“ More than a fortnight ago, I was asked by Mr Mitchell to visit a child, æt. 10 months, of a scrofulous family, who had passed well through the measles some weeks before, but seemed then to have symptoms of ileus, which had begun the day before.

“ The child was hot and very restless ; pulse strong ; abdomen tense, and evidently tender, particularly at the upper part, and, as we thought, on the right side ; vomited what he sucked or drank, and had thrown up calomel and castor-oil ; belly costive.

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\* These changes are explained at large in the quotation from Cruveilhier, in p. 329.

† See Cases 5th and 6th.

“ He had leeches to the abdomen twice, glysters and fo-  
“ mentations: the heat of skin, tenderness, and vomiting,  
“ abated much; his bowels became open; stools at first of  
“ a dark-green, afterwards more natural. He was very dull  
“ and drowsy for two days, so as to excite suspicion of hy-  
“ drocephalus, but afterwards became more lively, and ap-  
“ parently convalescent; sucked well, and slept well several  
“ nights. He was still restless, however, at times; and at  
“ others seemed sick, and retched a little, without vomiting.  
“ He cried a good deal occasionally, not drawing up his  
“ legs as if griped, but bending his body backwards.  
“ When getting apparently better of the abdominal com-  
“ plaint, his right arm was observed to be painful on exten-  
“ sion, and then the elbow swelled with evident effusion in  
“ the joint: two leeches, and afterwards two small blisters,  
“ were applied; but the swelling continued, and an abscess  
“ formed in a few days below the elbow, on the ulna, the  
“ communication of which with the joint was doubtful;  
“ but as it was rapidly pointing, it was opened on Sunday  
“ the 24th, and an attempt made to close the orifice imme-  
“ diately,—but by his restless motions in the night the  
“ wound was opened, and a dark-coloured matter was dis-  
“ charged on Monday. He was then rather more restless,  
“ —not hot,—had some cough,—and hoarseness, which  
“ had been coming on for some days,—sucked well, and  
“ swallowed easily,—but retched a little at times. That  
“ evening he slept quietly for some time. In the night he  
“ became much more restless, cried much, and twisted his  
“ body about in all directions; and in the morning his skin  
“ was cold,—pulse hardly perceptible,—eyes turned up.  
“ He died at 1 P. M.

“ His bowels were rather costive throughout, and he had  
“ several doses of magnesia, scammony, and castor-oil,  
“ which operated in very moderate quantity.

“ This is all I can remember of the symptoms.  
 “ On dissection, the abscess in the arm was found to  
 “ communicate with the cavity of the joint, as did other  
 “ smaller abscesses around it, by ulcerated openings. The  
 “ joint was full of dark-coloured pus; the cartilages cover-  
 “ ing the ends of the radius and ulna, and a little of that  
 “ covering the end of the humerus, were ulcerated.  
 “ The lower part of the right lobe of the liver was un-  
 “ usually vascular, and there was a little adhesion of this  
 “ all along the adjacent peritoneum.  
 “ The spleen was somewhat large, hard, and mottled  
 “ internally with yellowish spots, apparently incipient tu-  
 “ bercles. On its right side there was a gelatinous effusion  
 “ adhering firmly. There was a large aperture on the left  
 “ side of the stomach, and its contents, curdled milk, mixed  
 “ with a little blackish matter, were lying betwixt it and  
 “ the spleen. The edges of the aperture were so soft, that  
 “ they gave way on raising it up,—and the size of the  
 “ aperture, therefore, cannot be stated, but it occupied al-  
 “ most the whole of the left extremity; its edges quite ge-  
 “ latinous and translucent; the mucous membrane was al-  
 “ tered in this way more extensively than the serous, and  
 “ there was a very well defined line, but with no unusual  
 “ vascularity, where the change of the mucous membrane  
 “ terminated. The rest of the stomach, intestines, and me-  
 “ senteric glands, healthy. The peritoneum where the  
 “ contents of the stomach lodged, not altered in texture,  
 “ but of a red colour.”

The perforation in this instance seems to have resembled strongly that which occurred in my first case. The symptoms which are noted as present when Dr Alison first took charge, indicate peritoneal inflammation, the effects of which were visible after death in the region of the liver and spleen. If the disease, which ultimately produced disor-

ganization of the stomach, is to be dated from the same period, and attributed to the same cause, it will confirm the view which I have taken of the theory of this singular disease. Many of the symptoms in this case are similar to those enumerated in my paper. The absence of diarrhœa is worthy of remark, as contrasting singularly with my cases. Dr Alison suspects that the acute symptoms, which occurred the evening before the child's death, may have been occasioned by the bursting of the stomach; but it appears to me, that, if the stomach had given way at this time, its contents would have been generally diffused throughout the abdominal cavity, or at least throughout the whole inner surface of the sac of the omentum. This seems always to have happened in the interesting cases related by Gerard\*, and others, in which the stomach actually gave way during life. Besides, the same cries and contortions of the body which occurred at the period in question, are mentioned in many of Cruveilhier's cases†, in which the stomach was found in a gelatinous state, without any perforation or effusion of its contents. On the other hand, the redness of the peritoneal surface in the situation of the effusion, favours Dr Alison's hypothesis; and it seems not unlikely that overdistension of the stomach, or unusual action of its fibres in retching, or pressure on the epigastrium, may occasionally cause that organ to give way, when its substance has been softened and disorganized by this disease. More observations are wanted to enable us to pronounce confidently on this point.

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\* *Des Perforations spontanées de l'Estomac*, Paris 1803.

† See above, p. 326. 327.

CASES  
OF  
PERSONS STRUCK BY LIGHTNING.

BY ALEXANDER MACAULAY, M. D. Fellow of the Royal  
College of Surgeons, Edinburgh.

*(Read 7th May 1823.)*

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**T**HE accidents which occur from lightning are generally so instantaneously fatal, that no room is afforded for medical treatment; and few cases I believe are on record, where there is any detail of the appearances in the dead bodies of those who have suffered. In this slight notice of the following cases, which occurred during one thunder-storm, I am sorry I cannot do any thing to supply the last mentioned deficiency; but the statement of the consequences of the electric shock, and the treatment successfully pursued in the cases not fatal, will, I hope, be not uninteresting.

On the 16th of April 1812, the Coldstream East Indiaman, being in the neighbourhood of the Line,



was struck by two shocks of lightning, at an interval of about fifteen seconds. The effect was terrible. The main-top-gallant-sail was burnt, the main-top-gallant-mast shivered into splinters, the main-top-mast shattered, so as to be useless; and pieces driven out of the main-mast six feet long. Marks of fusion appeared in a brass-pulley at the top of the mast. The lightning struck the mast in a spiral direction; and killed a Lascar who was standing on deck at the foot of it. I did not see him with any signs of life, nor am I aware that any one else did. I therefore believe his death to have been instantaneous. No marks appeared on his body; and circumstances precluded the possibility of any thing being ascertained by dissection. Another Lascar was rendered insensible, but recovered in a quarter of an hour. Three Englishmen were severely injured; the outlines of their cases were as follows.

#### CASE I.

George Brown, gunner's mate, was taken up in a state of the most perfect apoplexy. His countenance was livid and bloated; his whole body covered with a cold clammy sweat; his breathing oppressed and stertorous; his pulse slow, strong, and full, and the powers of sense and voluntary motion suspended. Venesection was immediately had recourse to; and fifty ounces of blood taken away in a full stream;

by which the stupor and other urgent symptoms were removed. This treatment was followed up by purging, and the other parts of the antiphlogistic regimen. In about three days he complained of much pain in the region of the liver, which was removed by the application of a blister. He gradually recovered without any further affection of the head.

#### CASE II.

Samuel Cramp, seaman, was in the main-top when the ship was struck; he was able to come down, and go to his birth, but was shortly afterwards seized with strong epileptic fits. Happily for himself and the bye-standers, these fits were preceded by the imagination of a figure coming towards him. The ship's company, a few days before, had got among them some ghost-story of a seaman in a red shirt, who walked out to the bowsprit end, and then disappeared. The approach of this spectre-sailor was, to the poor sufferer (who uniformly desired us all to look at him), a signal of the attack of convulsions so violent that it required six men to hold him. Bleeding was largely employed in this case also. Febrile symptoms continued for several days; and about the fourth day after the accident, the patient seemed to have lost his voice. This, in two days, he suddenly recovered; and explained the circumstance by saying, that any attempt at speaking

gave him acute pain in the right side. His former health was restored, his epilepsy never returned; but long afterwards, when, as is too much the custom with his class, he indulged in the use of spirits, the intoxication produced was loud and turbulent, unlike his former manner, in similar circumstances.

### CASE III.

The other man hurt was a soldier of the St Helena Regiment. He also was seized with epilepsy, without any peculiarity of symptoms. Bleeding put a period to the paroxysm; but the fits continued to recur for several weeks after. He was said to have been subject to epilepsy, but had not been attacked during the voyage previous to the thunder-storm.

All the cases shewed evident marks of determination to the head. A question might arise, whether the phenomena were to be ascribed to the direct action of the electric matter, or were produced through the medium of the passion of fear. Among the species of apoplexy enumerated by Dr Cullen, there is one which he denominates *Apoplexia mentalis*; and Dr Gregory used to give as an example of this, the case of an elderly lady who was much alarmed by very vivid lightning, complained of headache, which went on to apoplexy, and proved fatal in thirty-six hours. In the two Lascars, and the

gunner's mate, the effects were so rapid, that there does not appear to have been time for any passion of the mind to operate. The seaman in the main-top who was able to come down, might have had his epilepsy induced by fear, a passion which very frequently has that effect.

It is remarkable that two of the patients complained of pain in the region of the liver.

OBSERVATIONS  
ON THE  
PATHOLOGY  
OF  
SCROFULOUS DISEASES,

WITH A VIEW TO THEIR PREVENTION.

By W. P. ALISON, M.D. F.R.S. E. and Joint Professor of  
the Theory of Medicine in the University of Edinburgh.

*(Read 5th June 1822, and 6th August 1823.)*

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**T**HE experience of medical men in all ages having shewn that scrofulous diseases are among the most untractable, and when seated in organs of importance, or assuming an aggravated form, among the most fatal that affect the human body in this climate, any inquiries which promise to elucidate the causes from which these diseases originate, and thereby to give additional precision and confidence to our notions of the means of preventing them, must be allowed to possess great importance; and the great diversity of the practice recommended by different authors, even at the present day, in the early and most remediable stages of scrofulous dis-

cases, seems to render such inquiries peculiarly desirable. The remarks on this subject which I have to lay before the Society, are not in so complete a state as I could wish; but I am induced to offer them to the consideration of the profession, chiefly by the circumstance, that the evidence which is required to make them more complete, is, in several instances, of a nature not to be obtained, to the extent that is to be wished, by the researches of any individual; but may be procured, without much difficulty, by the united observations of different medical men, whose attention may be directed to the subject.

Before proceeding to the proper business of this paper, I think it will be of importance to consider a discordance repeatedly noticed by Dr Young, but of which I believe many medical men are not aware, between the statements of systematic authors, and of several practical writers of high authority, in regard to the time of life at which Phthisis Pulmonalis, the most fatal of all diseases commonly regarded as scrofulous, is the most prevalent.

It has been commonly stated by systematic authors ever since the time of Hippocrates, that hæmoptysis and phthisis occur rarely before fifteen or after thirty-five years of age; and every one must recollect Dr Cullen's ingenious speculations to explain their frequent occurrence at that age. But the few authors who have been at pains to collect experience on this subject on a large scale, have found that this representation is by no means accu-

rate, at least in relation to the lower orders of the community. Dr Home states, in his *Clinical Experiments*, that of the phthisical patients he had treated in the clinical wards here, “about half were “at least forty years of age, and some of them much “beyond that period.” In Bayle’s *Treatise on Phthisis*, there is a table of the ages of 100 persons, all above the age of 15, who died of phthisis in a year, in the Hospital of La Charité at Paris;—of whom 33 only were below the age of 30, and 67 above it, and 44 of these last above 40 \*. Of 135 deaths from phthisis in two years, at Chester, of which we have an account by Dr Haygarth †, 25 occurred before the age of 15, 42 between 15 and 30, and 68 above 30; of which last number, 44 were beyond the age of 40. Of 96 deaths from phthisis at Warrington, which are recorded by Dr Aikin ‡, 24 were below the age of 14, 36 between 14 and 15, and 36 (or  $\frac{3}{8}$ ths of the whole) beyond the age of 45. Of 75 deaths from phthisis in the Dispensary at Plymouth, 10 occurred before the age of 15, 16 between 15 and 30, and 49 beyond the age of 30; 23 of these beyond that of 40 §. Of 214 deaths by phthisis at Carlisle, recorded by Dr Heysham, 59 occurred before the age of 15, 60 between

\* Bayle, p. 42.

† *Phil. Trans.* vols. lxiv. and lxv.

‡ *Phil. Trans.* vol. liv.

§ Woolcombe, *Remarks on the Frequency and Fatality of different Diseases*, p. 75.

15 and 30, and 95 beyond the age of 30; of which last number, 61 were beyond that of 40\*. Excluding the case of Warrington, where the ages set down in the table are different from the others, we have, in all these tables, records of 524 deaths from phthisis, by accurate and intelligent observers, and of these there are,

Under 15, - 94, or nearly  $\frac{1}{4}$ .

Between 15 and 30, 151, or hardly more than  $\frac{1}{4}$ .

Above 30, - 279, or more than  $\frac{1}{2}$ .

and of these,

Above 40, - 172, or just  $\frac{1}{3}$ .

In Sussmilch's Table of the deaths at Berlin in 1746, of 620 deaths from phthisis, 251 are stated to have occurred before 15 years of age, 73 between 15 and 30, and 296 after the age of 30; and of this number 230 occurred after that of 40.

In the practice of the New Town Dispensary here, there have been 55 deaths from phthisis in the last two years. Of these, 8 occurred before 15 years of age, 13 between 15 and 30, 34 after 30, and of these last 24 after 40.

These collections of facts, pointing out the pretty uniform diffusion, over the different periods of life, of deaths from phthisis, must be allowed to shew, that the altered balance of the circulation taking place after the age of puberty, though it may no doubt contribute in many cases to the production of phthisis, is much too limited a foundation for a

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\* Milne on Annuities, vol. ii. p. 464.



satisfactory pathology of the disease, and can by no means be trusted to as a guide to the means of prevention.

I apprehend it will be found, however, that there is a material difference, in general, between the phthisis occurring below the age of 35, and that occurring later in life, not so much in the symptoms as in the intimate nature of the disease.

The observation, of the greater frequency of deaths from phthisis beyond the age of 40, than between the age of puberty and 30, is, I believe, applicable to the lower orders only; among the higher, the occurrence of fatal phthisis beyond the age of 40, is certainly rare in comparison with its occurrence between 15 and 30;—but when we take into account the difference, which I believe is most generally seen on dissection, at different ages, the reason of this will perhaps appear, and lead to important reflections.

Dr Abercrombie justly observes, in regard to consumption, that it may be regarded as, in every instance, “ the ulceration of indurated lungs; but  
“ that, in the mass composing this ulceration, there  
“ is a variety of structures, differing remarkably  
“ from each other in their texture, and probably  
“ differing materially in the morbid changes which  
“ they undergo. The white tubercle and the he-  
“ patised induration, appear to form the two ex-  
“ tremes. The white tubercle seems to pass slowly  
“ and insidiously into ulceration, without active  
“ symptoms; while the hepatised induration is of-

“ ten the seat of considerable inflammatory action.  
“ The mass of indurated lung, where we have an  
“ opportunity of observing it at an early period, be-  
“ fore it has been much destroyed by ulceration, ge-  
“ nerally appears to be composed of a mixture of  
“ these structures ; and the proportions of them va-  
“ ry in different cases. Hence probably arises a  
“ great variety in the morbid actions, some being  
“ more and others less acute, and a corresponding  
“ variety in the treatment that may be adopted in  
“ the early stages ;—some cases being the subject  
“ of antiphlogistic treatment, with considerable pro-  
“ spect of our being able to arrest their progress ;—  
“ others advancing slowly and insidiously, without  
“ any mode of treatment being of the smallest  
“ avail \*.”

To this it may be added, that the hepatised in-  
duration of the lungs is in all probability not mere-  
ly the *seat*, but also the *consequence*, of stronger  
inflammatory action than the white tubercles ; and  
that these last depend always, in part, on original  
peculiarity of constitution, whereas the former may  
be produced in any habit of body.

Now, from any thing that I have ever observed,  
I would say decidedly, that the simple white tubercles  
imbedded in the lungs, with little surrounding hard-  
ness of the pulmonary substance, occur much more  
frequently in the young than in the middle-aged,  
or in persons advanced in life ; and that a much

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\* Edin. Med. and Surg. Journ., Jan. 1822, p. 30.

greater part (often the whole) of the induration in the ulcerated lungs of older people, consists of the hepatised induration, or dark-coloured condensation of the proper pulmonary substance\*. And it is a farther confirmation of this observation, that the melanosis of Bayle, (which differs but little from what Dr Abercrombie calls the hepatised induration †), he says, “ n’affecte que les adultes, et surtout les personnes avancées en age.”

Of the 24 fatal cases of phthisis, beyond the age of 40, stated above to have occurred in the practice of the Dispensary in the last two years, 12 were examined after death; in 6 of these there were no white tubercles remarked, and in the others the proportion of them was generally small. I have observed the same thing in various other dissections. I have even seen, in persons somewhat advanced in

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\* “ Lorsque des vieillards affectés d’une de ces phthisies extrêmement chroniques,” says Bayle, “ succombent à une autre maladie, on voit dans leurs poumons des ulcerations circonscrites, des tubercules peu nombreux, et des endurcissements tres consistans autour de l’ulcere.”—*Recherches*, p. 49.

† In proof of the correctness of this assertion, I need only refer to the two cases which he gives as characteristic specimens of the morbid appearance to which he gave that name. (*Obs.* 19. and 20, p. 209. *et seq.*) In both, the pleura covering the affected portions of lungs was much thickened, and adhering firmly to the pleura costalis. The diseased portions of lungs had more than the consistence of liver, and a very dark colour, and the ulcers contained in these occupied but a small part of the diseased texture. The melanosis of Laennec and Breschet is different.

life, all the usual symptoms of phthisis,—long continued cough,—short breathing, with asthmatic paroxysms,—hectic fever, with profuse sweatings, and much emaciation,—repeated hæmoptysis, and a mixture of puriform matter in the expectoration,—where it has turned out on dissection, that there has been no ulceration of the lungs, but much disorganisation, which, I have no doubt, from the history before death, as well as the appearance after, was the consequence of inflammation; portions of the lungs hardened and condensed,—others in a soft pulpy state, nearly resembling the ordinary texture of the spleen, and others loaded with effused serum, with much adhesion of the pleuræ, and much effusion into the bronchiæ.

If this observation shall be confirmed by others, it may be supposed that the phthisis which is fatal to young persons, is more generally the effect of organic change of structure,—of the deposition of the matter of the white tubercles,—and depends more on circumstances of predisposition; and that that which is so common in older persons of the lower orders, is more to be ascribed to frequent irritation, and to repeated and neglected inflammation, not originally of an unhealthy character.

In confirmation of this opinion, we may refer to the observation made by Home and others, that although, in the upper ranks of society, there are more female phthisical patients than male, probably from the greater variation of dress; yet in the lower, among whom the disease is prevalent so much later

in life, it is the males that are chiefly subject to it, evidently in consequence of their more frequent exposure to cold and wet\*.

Another fact, which still more clearly demonstrates the effect of repeated irritation of the lungs in producing, even in constitutions not predisposed to it, that modification of phthisis which occurs in middle and advanced life, is the well known unusual frequency of the disease in those workmen who are much exposed to irritation of the lungs, particularly such as are in the constant habit of inhaling various fine powders into their lungs,—in coal-heavers, dressers of flax and feathers, needle-grinders †,—in the workmen in the mill-stone quarries of Waldshut ‡, and in the stone masons in this country. I have witnessed many melancholy examples of the disease among the latter class, at the age of 40 or more, and in well-made men, of apparently vigorous constitution, and the appearances on dissection have been what I have stated above; and I have reason to believe, that there is hardly an instance of a mason regularly employed in hewing stones in Edinburgh, living free from phthisical symptoms to the age of 50.

These facts appear to illustrate the more general fact of the more frequent occurrence of phthisis in the lower ranks than the higher, at advanced pe-

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\* Young on Phthisis, p. 293.

† Johnstone, Southey, Young.

‡ Young, p. 206.

riods of life ; and to shew that the phthisis of that time of life depends chiefly on repeated and neglected irritation and inflammation ; and that the means of prevention, or even of cure in cases early and judiciously treated, must be sought chiefly in attention to avoid the ordinary causes of inflammation, and in early and suitable medical treatment when the first symptoms of it appear, such as it is the object of well devised and well conducted medical charities to afford.

The phthisis of young persons, on the other hand, we must regard as almost exclusively a scrofulous disease, and our success in the prevention of it must depend mainly on our knowledge of the causes of scrofulous action.

An inquiry into these naturally divides itself into two parts, which it is of more importance in regard to this than most other diseases, to keep strictly separate from each other. The first object is, to determine *the circumstances* on which the *scrofulous habit*, or *constitutional predisposition to scrofula* depends, or by which it is increased ; the second, to ascertain the *mode in which scrofulous diseases are excited*.

I. In regard to the *nature* of the external causes of scrofula, I have nothing new to offer ; but in regard to their *relative importance*, it appears to me that too much stress has been in general laid on the circumstance of hereditary descent, which is irre-

mediable in regard to all, and of climate, which is irremediable, as affecting the bulk of the community; and too little pains taken to *determine the amount* of the agency of other circumstances known to dispose the body to take on scrofulous disease, from the cold and wet weather of our winter and spring.

In attempting to procure information on this subject, I wish to lay as little stress as possible on individual observation, and trust chiefly to facts occurring on so large a scale, as to be freed from sources of fallacy which vitiate many medical reasonings.

A very little observation is sufficient to shew, that those who suffer most from the agency of cold, as a cause of disease in general, are by no means those who are most frequently exposed to it, but those whose previous condition is such as to favour its operation on the body, and particularly those in whom the circulation, either from the state of the constitution, or accidental circumstances, is feeble, and easily depressed.

One decisive proof of this, on a large scale, is the fact, that the greatest amount of disease and of mortality produced by very cold weather, is always among aged persons, who must, in general, be much less frequently exposed to the weather than younger people.

The most striking proof that I know of the influence of cold weather on the constitution in advanced life, is contained in Dr Heberden's Table, in which a comparison is shewn between the mor-

tality in London in the first five weeks of 1795, when the mean temperature was 23°, and the first five weeks of 1796, when the mean temperature was 43°.

The numbers of deaths in all ages, and above 60, were as follows :

		Whole No.		Above 60.
1795,	-	2823,	-	717
1796,	-	1471,	-	153

So that the whole deaths in the severe season were to those in the mild as 100 to 52, but those in persons above 60 as 100 to 21\*.

A difference somewhat similar, though not nearly to so great an extent, was observed in the month of January 1814, when the mean temperature was 25°.5, as compared with January 1813, when it was 35°. The deaths in these months were as follows :

		Whole No.		Above 60.
1813,	-	1443,	-	296
1814,	-	1677,	-	419†.

The whole deaths in the severer season were to those in the milder as 100 to 86, and the deaths above 60 as 100 to 70.

Another clear proof, on a large scale, of the important principle above stated, is, that the inhabi-

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\* Heberden on the Increase and Decrease of several Diseases, p. 52.

† Milne on Annuities, vol. ii. p. 511.



tants of large towns, although less exposed to the weather than country people, being, as daily experience shews, of weaker habit of body, and less able to resist its influence, suffer much more frequently and severely from the diseases that are excited by cold. It is unnecessary to quote authorities to prove the great mortality of large towns, as compared with the country. We all know, that, in the inhabitants of towns of a certain magnitude, the annual number of deaths exceeds that of births, so that it is only by continual accessions from the country that their population is maintained. The annual influx into London, required to keep up the level of its population, has been rated, though probably inaccurately, as high as 10,000 persons\*.

Now, when we examine the diseases which are the most frequent causes of death in large towns, we shall find, that a very large proportion of them are such as are chiefly excited by exposure to cold. We have kept, for two years past, with much care, a record of all the deaths that have occurred in the practice of the New Town Dispensary, the patients of which Institution being chiefly of the lowest rank, are just of that class in which the great excess of mortality, in consequence of their place of habitation, will chiefly occur. The whole number of deaths is 389, and of this, the numbers who died

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\* Malthus on Population, vol. ii. p. 60.

of diseases generally allowed to be produced, or much aggravated, by cold, were as follows :

Pneumonia and Bronchitis,	-	-	43
Carditis,	-	-	4
Cynanche Trachealis,	-	-	3
Tonsillaris,	-	-	1
Phthisis,	-	-	55
Asthma, and Hydrops cum Vitio Pulmonum,			24
Hepatitis Acuta,	-	-	3
Enteritis, and Dysenteria,	-	-	15
Scrofula Externa,	-	-	5
Interna (simple or complicated),			23

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Of the whole of these deaths, therefore, nearly one-half may be stated to have proceeded from diseases which are generally excited by this cause. But there are, besides, 41 cases of hydrocephalus,—generally a scrofulous inflammation, and evidently often induced by cold,—in proof of which I may state, that of these 41, 27 occurred in the winter and spring quarters, and 14 only in the summer and autumnal quarters: Farther, to this we must add the aggravation of many other diseases, particularly of fever, small-pox, of the febris infantum remittens, of measles and hooping-cough, so frequently produced by exposure to cold at their commencement, or during their progress. The deaths from these five diseases, taken together, are 92;—so that I think we shall be safe in asserting that this cause

is intimately concerned in the production of fully two-thirds of the deaths among the lower orders in a great town in this climate. We shall also be quite within bounds in asserting, that the whole mortality among them is double that of the inhabitants of most country districts\*. Hence the mortality resulting *from this cause alone* in a large town, is to the *whole mortality* in the country as  $= \frac{2}{3}$  to  $\frac{1}{2}$ , or as 4 to 3; and if we suppose that the same *proportion of the deaths* occurring in the country as in town are from this cause, the *mortality among the people* caused by it in a given time, in the latter situation, will be to that in the former as 2 to 1.

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\* It is impossible at present to obtain even an approximation to a statement of the mortality in those parts of Edinburgh in which the patients of the Dispensary reside, in consequence of the number of the inhabitants of the other parts of the town, and even of the adjoining country, who are buried in the same church-yards. But at the time when the town was almost confined to those portions of which I now speak, the mortality in it, according to the information obtained by Dr Price, was 1 in 20; and it is well known that his statement of the mortality in great towns in general, was from 1 in 19 to 1 in 23; and in country villages from 1 in 40 to 1 in 50. Mr Malthus states the average mortality of the agricultural part of the country, including sickly seasons, at 1 in 46 or 48\*; and many of the registers of country parishes, both in England and Scotland, appear, by the collections of Dr Percival, and by the Statistical Accounts, to indicate a rate considerably lower than this.

\* On Population, vol. ii. p. 55.

It is unnecessary here to pursue this subject farther,—but it were easy to adduce other facts, particularly from the extensive and decisive experience of military and naval practitioners, to shew that a previous weak state of the body, and previous debilitating causes, such as those so judiciously enumerated by Cullen, as disposing the body to suffer from cold, “Fasting, evacuations, fatigue, a last night’s debauch, excess in venery, long watching, much study, rest immediately after great exercise, sleep, and preceding disease,” have much more effect on a large scale, in determining the amount of disease produced by this agent, than the mere circumstance of reduction of temperature; and, on the other hand, that “the circumstances enabling persons to resist cold, are chiefly a certain vigour of constitution, exercise of the body, the presence of active passions, the use of cordials, and the power of habit\*.”

Now, what is true of the production of disease in general by exposure to cold, seems to be true of the production of scrofulous diseases in particular; but with these limitations, 1. That scrofulous action appears to be excited almost solely in the earlier periods of life †; 2. That to the production of this

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\* First Lines, vol. i. p. 93.

† This is probably connected with “the only well established peculiarity in the anatomy of the arterial system in early life;—the much greater absolute size of the capillary branches.” Gordon’s Anatomy, p. 61.”

kind of diseased action, there appears to be required, besides other conditions, a certain peculiarity of habit, not understood, but manifestly hereditary ; and, 3. That the constitutional debility, which disposes to scrofulous disease from cold, appears to be more permanent and habitual than that which disposes to the other diseases resulting from this cause.

The term *disease of debility* is much too vague for scientific discussion. It is easy to see that it is not every one who is weakened, even permanently, that becomes thereby disposed to take on scrofulous disease, nor every one who possesses considerable bodily strength, that escapes ; but if it appear on careful inquiry, that, of a given number of persons, previously weakened by other causes, a much larger proportion becomes affected with some form of scrofula than of an equal number, not so weakened, but otherwise similarly circumstanced, we are entitled to conclude, that *in many cases*, the scrofulous tendency depends in part on, or is much increased by, a state of general debility ; and it is probably only in so far as it depends on this cause that it is remediable.

The facts which seem most decisive as to the connection of the scrofulous habit with general debilitating causes, may be recapitulated as follows :

1. The differences in the symptoms and progress of inflammation, when scrofulous and when healthy, appear manifestly to indicate in the former case a languid state of the circulation, particularly in the capillary vessels of the diseased part.

2. The hereditary disposition to scrofula is chiefly transmitted from parents, and is most observed in children, who shew evident marks of constitutional debility in other respects.

3. There is no state of the body, as every practitioner knows, in which scrofulous action is so easily excited, as the state of great and often permanent debility, which remains after severe febrile disease, continued fever, small-pox, measles, scarlatina, or which follows the long continued use of mercury, or accompanies amenorrhœa.

4. The season at which scrofulous diseases have been observed to prevail most in this climate, is not that when cold weather has recently set in, and is most productive of disease in general, but the end of winter and the spring; and they are then chiefly observed in those young persons who have manifestly lost strength during the continuance of the cold weather. The gradual diminution of strength in weakly persons during cold weather, is naturally to be expected, (conformably with what we know of the agency of cold on the healthy body, and with other physiological principles,) from the habitual chilling of the surface, and more particularly from the little exercise taken by these persons in such weather. It is commonly stated, likewise, that scrofulous diseases are not so prevalent in the coldest climates as in milder, but moister climates, such as that of Britain, where the temperature, during most of the winter and spring, is from 32° to 45°, and the air usually moist; and it is perhaps to be expected,

that such weather will be more weakening and depressing to the constitutions of young persons than colder, but dry and frosty weather; because it will restrain them more from taking exercise, and will allow of less evaporation from the surface during any exercise that is taken. The observations made on this head, however, do not seem to me so decisive as they have been thought; because due allowance has not been made for the circumstance of the more northern countries which have been compared with Britain in this respect, being more thinly peopled, and a much smaller proportion of their population being the inhabitants of large towns.

5. The most leading fact in regard to the connection of the scrofulous tendency with debilitating causes, (and one which is of itself sufficient for the most important practical application that can be made of knowledge on this subject), is the much greater frequency of scrofulous diseases in the inhabitants of great towns, than in the agricultural population of any climate.

We have evidence, of amount amply sufficient, and of a kind much more decisive than the experience of any individual, to establish this point; yet it is not easy, from the want of nosological tables, including large numbers of cases, to put this evidence in a form quite authentic and satisfactory.

We know, however, that of the excess of the mortality of great towns over country districts, the greater part falls on the earliest periods of life. According to the tables quoted by Foderé, of the chil-

dren born all over France, (the great towns included), two-fifths die before the age of 5, one-half before that of 10, and two-thirds before that of 40; but in London, according to Dr Price's statements, taken from the bills of mortality, about the year 1770, more than two-thirds of the children born died before the age of 10, and one-half before that of 3; in Vienna and Stockholm one-half were then stated to die under 2; in Manchester, Dr Percival satisfied himself, that about the same time one-half of the children born died under 5; and the same rate of mortality was found to apply to Norwich\*.

On the other hand, there are many instances on record, in which the mortality of districts of the country has been found as much below the average, particularly in youth, as that of these great towns is above it. In several of the country parishes in Switzerland and in Scotland, the probability of life has been found as high as 45 years and upwards; that is, instead of half the persons born being cut off before attaining the age of 3 and 5, as at London or Manchester, half live to the age of 45 or more. " In the parish of Ackworth in Yorkshire, " it appears, by a very exact account kept by Dr " Lee, of the ages at which all died there for 20 " years, that half of the inhabitants live to the age " of 46; and there is little doubt, that if the same " kind of account had been kept in some of those " country parishes before mentioned, in which the

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\* Price on Reversionary Payments, vol. i. p. 264. *et seq.*



“ mortality is so small as 1 in 60, 1 in 66, or even  
 “ 1 in 75, half of the born would have been found  
 “ to live to 50 or 55\*.” In three parishes in So-  
 mersetshire, Mr Mansford found the probability of  
 life to be 45, 48, and 53 years†. Mr Malthus has even  
 quoted authority, which appeared to him satisfacto-  
 ry, for the probability of life, in one parish in Swit-  
 zerland being as high as 61 years‡; and according  
 to the same authority, (that of Mr Muret), in the  
 whole district of the Pays de Vaud only one-third,  
 and in some parishes one-fourth, or even one-fifth,  
 of the children born die before the age of 15 §. In  
 the village of Royton, near Manchester, Dr Perce-  
 val found, that one-seventh only of the children  
 born died before the age of 5; so that the mortality  
 under that age, in that village, was to that in Man-  
 chester as 2 to 7.

I examined lately a register, which I know to  
 have been kept with great accuracy for nearly four  
 years, of the deaths in a country parish in Scotland,  
 that of Rafford near Forres; the population of  
 which parish is almost exactly 1000 persons. Of  
 42 deaths that had occurred in that time, 2 only,  
 or 1 in 21, were below the age of 2, and 3 only, or  
 1 in 14, below that of 5 years; whereas in Man-

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\* Malthus on Population, vol. ii. p. 59.

† Inquiry into the Influence of Situation on Consumption,  
 p. 91.

‡ Ibid. vol. i. p. 474.

§ Ibid. p. 482.

chester, on an average of 20 years; the proportion of deaths under 2 years to the whole deaths was 1 to 2.9 \*. And lest it be said that this signal difference was owing to the prevalence of epidemic diseases, I may add, that small-pox at that time caused  $\frac{1}{4}$ th of the deaths, and measles  $\frac{1}{4}$  th of the deaths below 2 years of age at Manchester; but that after subtracting these, the deaths under 2 years of age, were, to the whole deaths at Manchester, as 1 to 4. Therefore the healthiness of this country parish, in the north of Scotland, so far as can be judged from four years experience, is to that of Manchester, to children under 2 years of age, as 21 to 4. Dr Perceval found, that, in the country parish of Waverton, near Chester, the deaths in 1775 were 12 out of 642 persons, or 1 in 53; and that of these deaths, 3, or  $\frac{1}{4}$ th, were below the age of 5; but of these 3, 2 were caused by the smallpox. Subtracting these, only 1 death out of 12 occurred below 5 years of age, which approaches very near to the state of the mortality at Rafford.

These facts, shewing the immense mortality among young children in towns, and the comparatively small number of deaths at so early a period of life, and high probability of life, in country places, even in lofty and cold situations, such as Switzerland and Scotland, are in themselves sufficient to shew, that the inhabitants of these districts, one half of whom live to 45, 50, or even 60 years of

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\* Perceval's Works, vol. iii. p. 107.

age, must be comparatively exempt,—notwithstanding their cold and moist climate and frequent exposure,—from the severer forms of diseases, the victims of which perish almost solely in the early periods of life.

It would be extremely desirable to have this evidence stated in a more detailed form, by comparisons of the deaths among children in a country district, and in a large town, arranged according to the diseases by which they are produced; but in attempting this, it will be found very difficult to estimate with precision the amount of mortality in a great town that may reasonably be ascribed to the scrofulous diathesis.

The great cause of death, as has been observed by Dr Davis \* and others, among the weakly children of the lower ranks in a great town, is inflammation of the lungs or bronchiæ, occurring either idiopathically, or symptomatically in other diseases. This is very often seen in children of scrofulous families, and of scrofulous appearance, and it may be very reasonably supposed, both that such children are rendered liable to this affection, and also that the inflammation in them is rendered untractable and fatal, by the weakness of habit, which likewise disposes them to scrofula; and in many of them accordingly, as I shall afterwards observe, the marks of incipient scrofula are found on dissection intimately combined with the consequences of the fatal

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\* Annals of Universal Dispensary for Children, p. 536.

inflammation. But it is impossible to speak with precision of the amount of mortality in such cases, which may be ascribed to the scrofulous habit.

We have unequivocal indications of scrofula, however, in a sufficient number of the fatal cases of children in large towns, to give a certain degree of precision to this discussion. I was told by one of the physicians of the Hôpital des Enfants Malades at Paris, where upwards of 500 children die annually, whose bodies are almost uniformly opened, that he believed nearly one-half of the bodies he saw opened had scrofulous tubercles in some part or other. This is probably a larger proportion than would be found in the practice of any institution in this country; and may serve to shew the power of scrofula in great towns, even in the climate of France\*. The deaths under 15 years of age in the practice of the New Town Dispensary for two years past, which may be taken as a fair example of the ordinary causes of the mortality among the children of the poor in our great towns, have been as follows:

Hydrocephalus,	-	-	40
Convulsio,	-	-	9
Febris,	-	-	3
—— Infantum Remittens,	-	-	6
			58
		Carry over,	58

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\* The fatal cases of Tabes Mesenterica alone, at that Hospital, are stated by Guersent, one of the physicians to it, at from 5 to 6 in the hundred boys, and from 7 to 8 in the hundred girls that die, a larger proportion than appears in our tables in Edinburgh,—*Dict. de Medecine*, Art. CARREAU.

	Brought over,	58
Cynanche Trachealis,	- -	3
Pneumonia and Bronchitis,	-	18
Pertussis,	- -	17
Variola,	- - -	32
Rubeola,	- - -	14
Scarlatina,	- -	3
Erysipelas,	- -	1
Enteritis and Ileus,	- -	3
Phthisis,	- -	8
Tabes Mesenterica,	- -	11
Diarrhœa,	- -	5
Sequelæ Rubeolæ,	- -	13
Hydrops,	- -	2
Morbus Cordis,	- -	2
Phlegmon and Ulcus,	-	5
Gangræna,	- - -	1
Scrofula Articularum,	- -	1
Ustio,	- -	3
Mors subitanea,	- -	1

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It will be readily allowed, that many more of these cases are truly scrofulous than the table shews, or can easily be constructed so as to shew. I believe, that nearly the whole of the cases of hydrocephalus may be regarded as examples of scrofulous inflammation, and many of them shewed other marks of scrofula. But we shall suppose 25 of them only to be of this kind. 4 of the cases of pneumonia, 4 of pertussis, 1 of erysipelas, 1 of febris infantum remittens, 1 of diarrhœa, 3 of ulcer, 2 of dropsy, and 4 of sequelæ rubeolæ, are recorded to have shewn

decisive marks of scrofula, either during life or on dissection. Adding these to the cases of phthisis, tabes and scrofula articularum, we have 65 of 201 decidedly scrofulous cases. If we consider, besides, that cases of chronic scrofulous diseases, manifestly hopeless long before death, are among those in which it is most common for the parents, after a time, to neglect giving attendance at this or other public institutions, we shall see reason to believe, that the proportion of decidedly scrofulous cases, in the deaths of the children of the lower orders in Edinburgh, is fully one third of the whole; and I have no doubt it might safely be estimated much higher.

Dr Davis gives, in the *Annals of the Universal Dispensary for Children in London*, an account unfortunately of 45 deaths only, viz.

Hydrocephalus.	-	-	8
Convulsio,	-	-	2
Catarrhus and Pneumonia,	-	-	6
Pertussis,	-	-	6
Rubeola,	-	-	6
Phthisis,	-	-	1
Anasarca,	-	-	2
Diarrhœa,	-	-	6
Tabes Mesenterica,	-	-	7
Morbus Lienis,	-	-	1
			—
			45

Taking these two last, the case of phthisis, and half of those of hydrocephalus, we have here 13 scro-

fulous cases out of 45, and we cannot doubt that, among the cases of pneumonia, pertussis and anasarca, there would be others of the same kind.

If we suppose two-thirds of the children born in London or Paris to die under 15, and one-third of these to be scrofulous (which the preceding statements fully justify), then two-ninths of those born in these cities die *scrofulous* under 15,—as large a proportion as die *of all diseases* under 15 in the parishes of Switzerland above mentioned.

We may safely assert, after these examples of other great towns, that the proportion of scrofulous fatal cases among children at Manchester, at the time when Dr Perceval wrote, was not less than a third.

At that time, half the mortality in Manchester took place below the age of 5; but  $\frac{1}{4}$ th of the deaths below 2 were from small-pox; and, in order to make ample allowance for this, we shall suppose the same proportion to extend to all the deaths under 5. There will still remain three-eighths of the whole mortality taking place under 5 years, independently of smallpox, whereas in the country parish of Waverton, as above stated, one-twelfth or  $\frac{3}{36}$  only, and in that of Rafford one-fourteenth or  $\frac{3}{42}$  only took place under that age. This makes the whole mortality under 5 years at Manchester to that at Waverton as 36 to 8, and to that at Rafford as 42 to 8; and the mortality *from scrofula alone* (one-third of the whole), at Manchester, to the *whole mortality* at Waverton, as 12

to 8, or 3 to 2, and at Rafford, as 14 to 8, or 7 to 4. Supposing the proportion of the deaths more or less owing to scrofula, to be the same in the country parishes as Manchester\* (which is certainly a very fair admission), the deaths of scrofulous children under the age of 5, in a given time at Manchester, will be to those at Waverton, as 36 to 8, or 9 to 2, and to those at Rafford, as 42 to 8, or  $10\frac{1}{2}$  to 2 †.

Mr Milne, in his Treatise on Annuities, has printed a very instructive Table, constructed by

\* It is to be remembered, that it is by no means denied, that scrofula may cause a large proportion of the deaths that occur in a country district in this climate in early life; all that these statements go to prove is, that it kills there a *comparatively small proportion of the people*.

† These country parishes are probably unusually healthy; but, on the other hand, it is always to be remembered in such comparisons, 1st, That any advantage to be derived from medical advice is clearly on the side of towns; which, in regard to the acute diseases of children requiring early assistance, must be considerable; and, 2d, That towns are continually receiving, and country parishes losing inhabitants, chiefly in youth and middle life, the mortality among whom is small, whereby the proportion of the mortality in early life, to the population, is rendered greater in the country, and less in towns, than it would be, if the population of both were stationary. It is only in this way that the extraordinarily small mortality in Manchester at the time noticed by Sir Gilbert Blane, (Med. Chir. Trans. of London, vol. iii. p. 38.) can be explained. In order to procure farther information on this important subject, a number of queries have been circulated pretty generally among the Scottish Clergy.



M. Nicander, from returns made by medical men, and by order of Government, shewing the number of persons that died of every known disease throughout Sweden and Finland for twenty-one years, ending with 1795, and also distinguishing, from the several results, the deaths in the cities of Stockholm and Carlsrona.

Throughout the whole country (the towns included), it appeared that, of 100,000 persons, 134 died annually of pulmonary consumption; but in the town of Stockholm 672, or five times the usual proportion, died annually of it; and in that of Carlsrona 243, or nearly twice the usual proportion. In the country at large also, 51 persons out of 100,000 are stated to have died annually of weakness of infancy; but in Stockholm 133, or nearly three times,—and in Carlsrona 257 or five times the usual proportion. I presume it will be admitted that a large proportion of these last cases would be scrofulous.

The frequency of phthisis among the natives of Naples, Sicily, Madeira, &c., is remarked by various authors, but I know of no comparative statements of its frequency in towns and in the country in these climates. I subjoin, however, a Table, formed by comparing the deaths, from some of the most important diseases, recorded in the Reports of the Dispensary of Philadelphia for six years, and published in the 1st volume of the Transactions of the College of Physicians there, with those that have occurred in the New Town Dispensary

here during two years. The striking fact here is, that although Philadelphia is  $16^{\circ}$  farther south than Edinburgh, and although accordingly the simply inflammatory diseases, and the other chronic diseases of the chest, are much rarer,—and the affections of the bowels, prevailing chiefly in autumn, much more frequent and fatal,—yet the cases of phthisis form even a larger proportion of the whole mortality than in Edinburgh. From this we are not entitled to conclude that the disease is really more frequent and fatal there than here. The whole mortality in Philadelphia at that time (1786 to 1793), was probably considerably less than it is now in the Old Town of Edinburgh, where almost all the patients of the New Town Dispensary reside; and therefore, the amount of mortality caused by phthisis, *i. e.* the proportion of deaths by phthisis to the whole number living, may have been smaller than here, notwithstanding that the proportion of these deaths to the whole number dying in a given time, was greater than here. But the fact is sufficient to shew, that the latitude of  $40^{\circ}$ , and a climate adequate to the production of the most virulent yellow fever, furnish no security against scrofulous disease to the inhabitants of great towns.

	Philadel- phia.	Proportion to whole Deaths.	Edin- burgh.	Proportion to whole Deaths.
Whole Number of Deaths recorded, }	439		389	
By Thoracic In- flammation, }	39	1 in 11.2	47	1 in 8.2
By Asthma and Hydrothorax, }	7*	1 in 62.7	24	1 in 16.2
By Phthisis, -	81	1 in 5.4	55	1 in 7.07
By Cholera, Diar- rhœa, and Dy- sentery, - }	87	1 in 5	11	1 in 35.3

Dr Rush long ago stated, that consumption is unknown among the Indians in North America,

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\* There may be some inaccuracy here, because, besides the cases of hydrothorax, 18 fatal cases of anasarca are recorded, some of which may probably have originated in thoracic disease. But, on the other hand, I do not include in the Edinburgh numbers under this head 7 cases of dropsy from organic disease of the heart, without much disease of the lungs. It may be thought, likewise, that some of the cases ranked as phthisis by Dr Rush, would be called asthma or hydrothorax in Edinburgh; but I am convinced, that if there be any difference in the naming of the chronic diseases of the chest, it must be one which would increase the number of cases of phthisis with us, for several of the cases of phthisis which occurred in very advanced life, had so much the appearance of mere Catarrhus senilis with asthma, that they would not have been set down as phthisis but for the appearances found on dissection.

I am well aware of the general objection to all numerical statements drawn from Dispensary practice, on account of the

who are constantly exposed to the vicissitudes of weather, and during great part of the year, to a very cold climate. This has been supposed to be owing to the hardships of their mode of life proving fatal to a great proportion of their children whose constitutions are feeble, at a very early period, and none therefore but robust constitutions being reared to maturity. But he has also stated, that “they multiply faster, and die in smaller proportion, than civilized nations;” and the facts that have been adduced, in regard to the health of children among some of those of the inhabitants of Europe, whose mode of life approaches perhaps the nearest to that of the Indians of America, may induce us to suppose, that this explanation is erroneous; and that the effect of that mode of life (partly no doubt on the parents and partly on their offspring), is to

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number of persons who give temporary attendance only at such institutions, during the course of chronic diseases; but I am persuaded this source of fallacy would not operate more extensively here than at Philadelphia. From the number of medical officers and well educated assistants in constant attendance on the severer cases of the patients of the New Town Dispensary at their own houses, I am sure there are fewer cases of patients dangerously ill deserting the charity, than in most similar institutions. It might also be thought, that the number of our phthisical cases is diminished, by many of these being received into the Hospital; but it is a standing rule in that institution, to admit as few phthisical cases as possible; and I believe I am quite safe in asserting, that the mortality from phthisis in it is hardly ever one-fifth of the whole. In 1821, it was 19 in 136 deaths, or 1 in 7.6

counteract the formation of the scrofulous tendency or habit.

It is not easy to collect facts sufficient to shew decidedly to what circumstances in the way of life of the children of the poor in great towns, the great prevalence of scrofula in them is chiefly to be ascribed. I am thoroughly convinced, from the amount of it that I have seen in families not suffering under any material privations, that it depends much more on want of pure air and exercise than on deficient nourishment. But it is enough for our present purpose to assume, what I presume will not be denied, that it is intimately and probably necessarily connected with the state of debility so conspicuous in children of the lower ranks in large towns, compared with those brought up in the country.

6. I apprehend we may go a step farther in pointing out this connection, and assert, that the weakness of system produced, in many cases, by residence in *hot climates*, during childhood and early youth, gives probably a disposition to scrofula, in those who are afterwards exposed to the exciting causes of it during early life. We know, at least, that a great majority of the inhabitants of these climates, both Negroes and Hindoos, are unusually prone to scrofula, when they come to temperate climates, and even suffer from it, in some instances, in their own, where Europeans are nearly free from it. I was favoured by Dr Fergusson, lately inspector of hospitals in

the Windward and Leeward Islands, in the West Indies, with a perusal of the reports of the deaths and chief diseases occurring in the army in these colonies, in each quarter, from March 1816 till March 1817, distinguishing the deaths among the white and black troops. The average strength of the army, during the whole year, was 7337 whites, and 5772 blacks; and of these there died,—

	Whites.	Proportion to whole Number.	Blacks.	Proportion.
Of Fever,.....	477	1 in 15.3	38	1 in 151.8
— Dysentery,.....	342	1 in 21.4	98	1 in 58.9
— Pulmonic Complaints,	82	1 in 89.1	128	1 in 45.
	901		264	

Fever, therefore, caused ten times as great a mortality among the white troops, as among the blacks, and dysentery nearly three times as great; but pulmonary complaints caused twice as great a mortality among the blacks as among the whites. The deaths from this cause were 1 in 10.9 of the whole mortality among the whites; and 1 in 2.06 of the whole mortality among the blacks.

The pulmonic disease among the black troops was almost exclusively Phthisis, which attacked them chiefly in the elevated situations in the interior of the islands, where the heat is least oppressive, and where the Europeans were the most free

from the diseases which, to them are in that climate the most fatal.

The unusual frequency of Phthisis among Negroes and Hindoos, and even among mulattoes and half cast people, in this climate, is I believe generally admitted.

It must be allowed, that as the black population of tropical countries have other peculiarities besides their being brought up in hot climates, we are not entitled to ascribe their scrofulous tendency to this circumstance. But I believe it will be found, that the children of Europeans, born and reared for a time in tropical climates, and brought to this country while still young, are unusually prone to scrofula also. Several such instances I have myself observed; and when we connect the facts above stated, with the enervating influence produced by long residence in hot climates, on European constitutions, so strikingly shewn in the different forms assumed by fever and by hepatitis in the old settlers and the newly arrived Europeans; and this, again, with the facts already adduced to shew the connection of general debility with scrofula,—it seems to me extremely probable, that this part of the constitution of Negroes and Hindoos, is very much owing to the long-continued application of heat in early life; and particularly to this cause acting on many generations successively.

I need hardly say that, although cold is one of the most decided sedatives that we possess, yet when

prudently employed, and applied to those whose circumstances and habit of body enable them to fortify themselves against its excessive action, it is the most powerful of tonics ; and that the converse holds in regard to the application of heat to the living body. On the influence of these agents on the diseases now in question, separated from the influence of other causes which have been considered, we have not yet all the information that is desirable ; but what I have now stated is perhaps enough to dispose us to think, that there is a compensation in the provisions of Nature on this subject, which has not been duly attended to ; that while she withholds from the inhabitants of hot climates the chief exciting cause of scrofulous disease, she denies to them at the same time one of the most powerful agents, by the prudent management of which, the constitution can be fortified against it.

*Lastly,* All that has been said of the effect of causes, certainly debilitating, in favouring the tendency to scrofulous diseases, is confirmed by what experience has shewn, of the effect upon that tendency, and even on the slighter forms of the diseases themselves, of such remedies as are truly and certainly strengthening to the human constitution. We have seen the effect of rural life on the scrofulous habit ; and every physician who has practised in a great town can testify, that in circumstances which demand the use of tonic remedies, and of no others, the most powerful that he can prescribe is a resi-



dence in the country. “ There,” says Dr Willan, speaking of the ill-defined symptoms to which he gave the name of Simple Asthenia, and which he found so common in London, “ a change of pursuits, “ a more regular plan of diet and exercise, a more “ clear and purer atmosphere, the salubrious exha- “ lations from growing vegetables, and the grateful “ stimulus of their odours, in a short time restore “ vigour to the body, and firmness and serenity to “ the mind.”—*Diseases of London*, p. 56.

All allow the efficacy of cold bathing, in certain circumstances, as a tonic ; and I believe most practitioners will admit the justice of Dr Cullen’s observation, that in the external scrofula described in his *First Lines*, cold bathing appears to be of more service than any other remedy : perhaps of service, more by fortifying the body against fresh attacks of scrofulous disease, than by accelerating the cure of what has already appeared. The rarity of Phthisis in butchers, which seems to be established by the researches of Dr Beddoes and Dr Southey, is another illustration, on a large scale, of the efficacy of a tonic regimen in lessening the scrofulous tendency. And to what general principle but that of an ultimate tonic influence on the circulation, can we ascribe the good effects on various local diseases, chiefly of the scrofulous character, produced by constitutional treatment, directed in the first instance to the improvement of the functions of the stomach and bowels ?

Now, having stated the different facts which prove the intimate connection of the scrofulous diathesis with constitutional debility, we have in fact stated all that has been ascertained in regard to it; beyond the general fact of its being, for reasons quite unknown, much more easily developed, even when all other circumstances are alike, in some persons than in others, and particularly in those whose progenitors have suffered from scrofulous diseases. It is possible, no doubt, that it may not be simply by weakening the body that all the causes I have mentioned dispose it to scrofula; but nevertheless, if we can ascertain, at present, *nothing else that is common to all these causes* but this, that they do weaken the body, we are fully justified in ranking them together, in the mean time, under this head; and in fact I believe we may comprehend all that has been ascertained of the causes by which the disposition to scrofulous disease is produced or increased, lessened or destroyed, under the general proposition, that whatever tends permanently to weaken the body promotes it, and whatever tends really and permanently to strengthen the body counteracts it. By far the most powerful of these last are, habitual exercise, pure air, the application of cold in various forms and with certain precautions, and mental excitation; and the evidence that has been stated on a large scale, seems to me sufficient to entitle us to add, that the action of causes of the latter kind must be both certain and power-

ful on the whole, although many circumstances may occur to embarrass the practical application of them in individual cases.

II. All that has yet been said applies only to the formation of the scrofulous habit, not to the excitation of scrofulous disease. We must understand the mode in which this is effected, as well as the circumstances of predisposition by which it is favoured, before we can have clear and fixed principles by which to regulate our attempts at prevention.

In some instances, scrofulous disease shews itself in well-marked inflammation, although of a peculiar character, proceeding from its usual causes, particularly from the long-continued application of cold. But in most cases, in which scrofulous diseases are fatal, the diseased action is in internal parts, and the first symptoms are obscure and equivocal. The chief, and certainly the most characteristic appearances on dissection are tubercles, in different stages of progress ; and the question as to the mode of excitation of scrofulous diseases, resolves itself into the question, How these tubercles are formed, and how the changes in them, which become dangerous to life, are produced ?

It is in this point of view, that the question in regard to the origin of scrofulous tubercles is chiefly important. We have considered the evidence, which enables us to assert with confidence, that the only remedies which can counteract the tendency to scro-

fula, are the most powerful remedies of the tonic kind. But if it be true, as some pathologists assert, that *inflammation* is one of the chief modes in which all scrofulous disease begins, we have equally sure grounds on which to proceed in asserting, that in many cases where we suspect the existence, or dread the immediate approach of these diseases, a system of treatment in many respects the opposite of the tonic,—rest, confinement within doors, light diet, and even antiphlogistic remedies, must be expedient ; and a decided judgment on this pathological question, seems to be quite indispensable, to enable us to form a practical opinion with any confidence, as to the circumstances in which either system of treatment may be advisable.

In proceeding to offer a few observations on this subject, I do not propose to consider all the questions regarding the formation of tubercles, which have lately occupied the attention of several pathologists ; but shall confine myself to the one which I have stated to be of by far the greatest practical importance,—the connection of the tubercles, in their origin and progress, with increased vascular action, and more or less of inflammation, in the textures in which they appear.

It is generally allowed, that in the lungs at least, the scrofulous tubercles are most commonly found, on dissection, accompanied with unequivocal indications of inflammation ; but it is seldom that cases occur, which enable us to form even a probable

opinion, whether the inflammation had preceded or followed their formation. It must be allowed, that the careful and minute enquiries which have been made of late years into this part of morbid anatomy, have not led to any very decisive results as to this question. The opinion, however, of most authors who have particularly attended to the subject of late years is, that the formation of tubercles is quite independent of inflammation. This is the opinion expressed in France by Bayle and Laennec, in regard to the tubercles of the lungs, and more lately by Andral in regard to those occasionally found in the intestines; and in England by Dr Baron, in regard to the formation of these substances, in all parts and in all circumstances without exception. The expressions of this last author are, that tubercles, and the disorganizations to which they lead, “are not the product of any species of inflammation; and that although inflammation may attend their growth, and modify *the symptoms* which they occasion, yet it is very different, both in its origin and consequences, from that which attacks a part unaltered by previous disease, being, *in the former case, the consequence*, and in the latter *the cause of altered texture.*”

The opinion of Laennec is expressed with more caution. He says that inflammation of the lungs, acute or chronic, occasionally coexists with tubercles there, and may probably sometimes become the occasion of the development of these, in subjects

otherwise disposed to their formation ; while in other cases, the irritation occasioned by tubercles already existing may induce inflammation ; but, although he admits of these two possibilities, yet he thinks many facts shew, that tubercles most frequently form without previous inflammation ; and that when inflammation does coexist with any tubercular affection, it is *most commonly posterior to it in date* \*.

On the other hand, the opinion which I believe has been on the whole more general, at least in this country, that tubercles are a product of a peculiar kind of inflammation, has been lately maintained with much ability, and perhaps in too unqualified terms, by Broussais. Several of the cases related by him †,—in which young men, previously fit for their duties as soldiers, have been seized with catarrhal or pneumonic symptoms, from a well marked exposure to cold, or an injury on the breast, have passed gradually into the state of phthisis, and died in a few months ; and have exhibited, on dissection, the lungs completely studded with tubercles of various sizes, and in various stages,—appear to me to furnish very strong evidence ; particularly, as the fact of their having been capable of military duty during the fatiguing campaigns of the French army, up to a given time before their death, fur-

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\* De l'Auscultation Mediate, tome i. p. 31.

† Hist. des Phlegmasies Chroniques, vol. ii.

nishes a sort of standard of the state of the vital organs up to that time ; but as, in all these cases, there appear to have been considerable marks of inflammation (adhesion and hepatisation) as well as the tubercles, found on dissection, the evidence deduced from them can hardly be said to be decisive. It may still be said, that the tubercles had all existed prior to the inflammation from the known external causes ; and that the symptoms, during the last few months of the patients' lives, had been the consequence of that inflammation supervening on the tubercles, and perhaps quickening their growth, but not producing them. It must be allowed, that there are few cases, in which tubercles are found on dissection, where this ambiguity does not exist.

The cases, which I have seen, that seemed to me to furnish the best evidence on this subject, have occurred in young children, whose symptoms during their illness were known to me.

From observations on such cases, I have been led to think, that where there is the constitutional tendency to them, tubercles may form in very different circumstances, and probably with very various rapidity ; and I have little doubt that they often do form without inflammation, of such a character as to be detected by symptoms during life, preceding them ; and that, in the lungs at least, the inflammation, of which the undeniable marks are so often found along with them after death, has

really often been posterior to them in date. But, I have also been led to believe, that it is not merely as Laennec states a possibility, but a real and frequent occurrence, that inflammation, acute or chronic (to which I would add, and febrile action), however produced, becomes, in certain constitutions, the occasion of the development of tubercles; and the facts which seem to me decisive on this point, I propose to lay before the Society.

I may observe, in the first place, that the example, on which Laennec lays much stress, of the formation of tubercular matter in external lymphatic glands, does not seem to me by any means unequivocally favourable to his notion of the *posterior date* of the inflammation. For although it is very true, as he states, that in scrofulous persons, these glands often swell gradually and pass into the tubercular state, with hardly any pain or swelling of the surrounding textures; yet it is surely not less true, that in persons of scrofulous habit, but previously healthy, these glands often inflame from cold, or the cervical glands from the absorption of the matter of Porrigo; the inflammation is not violent but obstinate; it declines after a time, but the gland continues swelled, and gradually passes into the state, first of scrofulous tubercle, and then of scrofulous ulcer. This course, I am persuaded that I have myself repeatedly seen; and if it be allowable to argue from cases of the former kind, that tubercular matter may be deposited independently of in-



flammation, it is surely equally fair to argue, from cases of the latter kind, that tubercular matter is sometimes deposited immediately after, and apparently in consequence of inflammation.

Mr Brodie has described, in his book on the Diseases of the Joints, several cases in which the yellow cheesy matter of tubercles was found in the cancelli of scrofulous diseased bones; and has given his opinion decidedly, that in the progress of this affection, the “bones first become preternaturally vascular, and containing a less than usual quantity of earthy matter; and that first a transparent fluid, and afterwards a yellow cheesy substance is deposited in their cancelli,” while at the same time, inflammation, and its undeniable consequences, effusion of lymph and serum, and suppuration, take place around the bones. And although we are not entitled to refer to the opinion of any author in a discussion on matters of fact, yet it is to be observed, that in several of the dissections recorded by Mr Brodie, this disease of the bones had been going on in different joints of the body at the same time, and in some had lasted longer and made much more progress than in others; and the opinion which he expressed in regard to the *priority* of the vascular or inflamed state of the bone, to the deposition of the tubercular matter, may therefore be fairly taken as proof that he had observed, that in the cases where the disease had made least progress, the former state was found without the latter. He mentions, indeed, several cases in which there were the usual

marks of the inflamed and softened state of the bone, but either only a small quantity, or none at all, of the cheesy matter deposited in the cancelli. Of these last one, at least, was a case in which the disease was manifestly in the first stage, and had not gone so far as to render amputation necessary, the patient having died from another cause (Case 41.) From these statements I think it appears clearly, that in these cases of disease of the joints beginning in the bones, and of which the symptoms are described as very uniform, the primary disease is not the deposition of the tubercular matter, but is a low inflammation, of which the deposition is a consequence, and which produces other consequences, in the bones and neighbouring parts. And to complete the chain of evidence on this point, it may be observed, that in one of the cases described by Mr Brodie, in which the symptoms had been similar,—and there was the same softness of the bones, with inflammation of the neighbouring soft parts, and ulceration of the cartilages,—there was found in the cancelli, not the scrofulous cheesy matter, but *thick pus*, (p. 239.)

The cases which have occurred to myself, in which it has appeared to me nearly certain that tubercles have formed in consequence of inflammation, I shall arrange under two heads.

I. The first consists of cases in which they did not cause death, and were found, on dissection, in an incipient state, but so immediately succeeding

to the symptoms, and so closely connected with, or even passing by insensible degrees into, the undeniable effects of inflammation, that it has appeared to me impossible to suppose that their formation had been independent of it \*.

### CASE I.

J. P., æt. 4, of a weak habit, but healthy, was seized, in the beginning of November 1822, with febrile symptoms, headache, and pain of abdomen, attended with tenderness on pressure; which last symptom, however, was not urgent. The febrile symptoms remitted repeatedly, but she continued subject to much pain of abdomen, generally with a loose state of the bowels, till the beginning of December, at which time I first saw her. The symptoms had just then undergone a remarkable change, —the pain of the abdomen was almost gone, but she had a great deal of vomiting, excited by almost every thing she swallowed, cold extremities, small

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\* In these cases the tubercles have generally been found solid but soft, of a greyish colour, and somewhat translucent, so that these observations confirm those of Laennec, as to this being the general appearance of tubercles in their commencement; and their yellow colour, perfect opacity, and consistence equal to that of firm cheese, being acquired by a process subsequent to their original formation. The last change to which these bodies are destined, I believe he is equally correct in stating to be softening, commencing in their centres.

often irregular pulse, and drowsiness approaching to coma, though without headache or delirium. These symptoms lasted with little change, except progressive emaciation, for ten days; the vomiting then ceased, and she was seized with convulsions, followed by coma and dilated pupils; in which state she lay four days, with occasional returns of convulsion, and died on the 19th December.

On dissection, the ventricles of the brain were found distended with serum.

Almost the whole peritoneum, except the covering of the stomach, was covered with an exudation, resembling the coagulable lymph so often thrown out on it by inflammation; except that it was generally of a somewhat yellower colour, and was disposed chiefly, though not entirely, in the form of round tubercular eminences, of various sizes, none so large as a split pea. By the intervention of this matter, numerous adhesions of the liver to the parietes of the abdomen, and bowels to each other, had taken place. In various places, where the exudation was thickest, the peritoneum was thickened, and very vascular. In the pelvis there was an irregular mass, of the same appearance, which hardly adhered to the peritoneum. The ligamenta lata of the uterus were much thickened, and of a deep red colour, and on cutting into them, much thick pus was found between their layers.

This was manifestly a case of conversion of abdominal disease into hydrocephalus. Had it not been for that conversion, the inflammatory appearances

in the abdomen might probably have subsided, the pain of abdomen having almost ceased long before death. The disease would then, I have no doubt, from what I have seen in other cases, in which there were depositions on the peritoneum in precisely similar forms, but of larger size and somewhat firmer consistence, have passed into the form of the tuberculated accretions on the peritoneum described by Dr Baron; and if this had been fatal at a subsequent period, it would have been impossible to judge whether inflammation had produced the tubercular masses that were found or not;—a point, on which the appearances observed in this early stage of the disease in the present case, left, I believe, no doubt whatever in the minds of the gentlemen who witnessed this dissection.

## CASE II.

J. M., æt. 2, was a healthy child, uncommonly fat and plethoric, when she was seized with measles, preceded by a convulsion-fit, in the end of May 1823. After the eruption had faded, she continued feverish, her breathing short, but cough trifling. I saw her on the 18th of June, at which time her symptoms were, quick pulse and warm skin, with evening exacerbations of fever, tendency to coma, with much moaning; pupils somewhat dilated, vision apparently imperfect, occasional rolling of head and drawing up of legs, and frequent grinding of

teeth ; tension and tenderness of abdomen, particularly the upper part ; her bowels had been irregular, and the fæces dark-green ; she had a papular, or rather tubercular eruption on different parts of the skin, which had come out within a few days. These symptoms continued with little change ; she had less moaning, and seemed more sensible on the 25th, but died suddenly, after a slight convulsion, on the morning of the 26th.

On dissection, the internal coat of the stomach was manifestly diseased, very red at some points, at others of a brownish colour and softened, with some abrasions towards the pylorus. The liver was firmer and paler than usual.

There were a number of small tubercles, easily rubbed off, on various parts of the peritoneum, all quite solid though several were exceedingly minute,—a few in the substance of the liver,—many in the spleen, which was somewhat enlarged and hard, and several beneath the peritoneal coat of the intestines. Some of the mesenteric glands were more vascular than usual, and a portion of these was tubercular.

There were many small tubercles on the surface, and in the substance of the lungs,—several of them inclosed in vesicles containing air\*.

The lower part of the left lung was very vascular, and hepatised, and in the middle of the hepatised portion, there was a large irregular tubercle, of firmer consistence than the others.

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\* See observations on Case 8. below.

The head, in which it is possible that the immediate cause of death existed, was not examined.

The circumstances that seem to me the most decisive, in regard to the cause of the very general formation of tubercles in this case, are,

1. That the state of the child's health, before the attack of measles, seems nearly to preclude the possibility of their having existed then.

2. That the child never recovered from the febrile and inflammatory symptoms produced by the measles, and died evidently of their sequelæ, about a month after their appearance.

3. That the symptoms before death were inflammatory, and the tubercles found after death, in various places, but particularly in the spleen, the mesenteric glands, and the lungs, were each surrounded with unusual vascularity,—and the large tubercle in the left lung with a considerable extent of hepatisation.

### CASE III.

M. W., æt. 21 months, was seized with measles in the end of June 1823, and the eruption disappeared on the 1st of July; cough and shortness of breathing, with heat of skin continuing. I did not see her till the 10th, at which time her breathing was very short, and somewhat croupy, her pulse very quick and sharp, but skin not very hot, and she had slight spasms. She died on the 12th.

On dissection, about two-thirds of the right lung, and one-third of the left, were found completely hepatised. In several spots on the surface, and in the substance of the hepatised portion of the right lung, there were small irregular masses of tubercular matter, which on examination appeared to surround minute branches of the bronchiæ that were filled with a puriform fluid. When examined with a microscope, these tubercular portions appeared to pass, quite by insensible degrees, into the adjoining hepatised lung. This appearance I have seen, and pointed out to various friends, in several other dissections; and, to use the language of geologists, being unable to discern any line of junction or separation between the tubercular matter and the hepatised induration, I have found it impossible to resist the conclusion, that in these instances these different substances were of contemporaneous formation\*.

#### CASE IV.

D. M., æt. 18 months, subject for six months to a discharge of matter from the left ear, and more recently to irregular febrile attacks and diarrhœa supposed to be connected with teething, but not subject to cough, or any pectoral symptom,—was admitted a patient of the Royal Public Dispensary on the 11th

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\* This child was well-formed, and there was no appearance of scrofula externally, nor of tubercles in any other part of the thorax.



July 1823, on account of measles; the symptoms of which had commenced a few days before. After the decline of the eruption, he continued subject to cough, and did not regain his appetite or strength. About the 24th July he became more feverish; his head appeared to be much pained,—he had occasional screaming and vomiting,—the cough continuing. When I saw him first, on the 1st August, he was comatose; his pulse about 100, sharp, somewhat irregular, pupils dilated, countenance pale, skin cool, body considerably emaciated, breathing rather short, with a mucous rattle in the throat. His appearance was hardly altered on the 2d; there had been a considerable discharge of matter from the left ear; he died on the morning of the 3d.

His body was opened on the 4th, by Dr R. Hamilton.

There was a little effusion of coagulable lymph on the surface of some parts of the pleura pulmonalis.

The cellular substance, immediately beneath the pleura, was in most places emphysematous; and, in many places, there were small elevations of the pleura, covering little cavities, a part of which only were filled with tubercular matter. Many of these were laid open, and examined with a microscope; and we could not ascertain that they contained any thing, excepting the tubercular matter, in a soft gelatinous state, generally disposed in irregular forms; and a little air\*. There were a great many small tuber-

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\* See Case 8. below.

cles, in the same stage of progress, dispersed through the substance of the lungs. Immediately adjoining the tubercles, both on the surface and in the substance of the lungs, there was, very generally, increased vascularity, and a degree of condensation of the pulmonary substance, but this was of so small an extent, that every part of the lungs crepitated in the usual manner, when cut across. The bronchiæ, as usual after the measles, were very vascular, and contained much muco-purulent matter.

The bronchial glands were enlarged, and sections of them shewed increased vascularity, and points of tubercular matter; and it was quite obvious, on minute examination with the microscope, that from the points where the tubercular matter was distinctly formed, there was a very gradual transition into the portions of the glands that retained the healthy structure, so that it was impossible to say where the healthy, but unusually vascular texture ended, and the tubercular substance began.

On the peritoneal surface of the diaphragm there was a spot of inflammation, with a deposition of matter exactly similar to that observed in Case 1., disposed in the form of irregular tubercles, beneath the serous membrane.

There was a considerable effusion of serum under the arachnoid membrane; the brain was very soft; and the ventricles distended with serum.

In the lower part of the left lateral lobe, the substance of the brain was of a red colour, and quite broken down; and a portion of the pia mater, im-

mediately beneath this, was destroyed by ulceration. The pia mater, immediately around this spot, presented an appearance, to which I would beg particularly to direct the attention of the Society. It is exactly similar to what was seen on the peritoneum in Case 1., and is represented in Plate IV. Fig. 1., engraved from a drawing, which Mr Watson, one of the members of this Society, was so obliging as to execute, with great exactness, while the parts were recent. It was very vascular, and there was much deposition in the most vascular portions, of a whitish matter, which appeared on examination to be between the pia mater and arachnoid coat, and to cause intimate adhesion of them. In some places, where the vascularity was most intense, this pia mater had the usual irregular form, and just the usual appearance of an inflammatory exudation; but in many others, it was disposed in little roundish masses, having exactly the same appearance as the tubercles of the lungs, and of the bronchial glands, in the same subject. These smaller deposits were of very various density; some appearing, on examination with the microscope, merely as ill defined nebulæ, dimming the transparency of the membrane; others as well defined, opaque, circular prominences; but none of them, either here, or in any other texture except the lungs, had the least appearance of being inclosed in vesicles, or cysts. They resembled, very nearly, the pustules so often seen on the tunica conjunctiva of

the eye, particularly in scrofulous persons, in their first stage.

We had here another opportunity of seeing tubercles in their incipient stage; the child having died in consequence of the disease of the brain, and effusion into the ventricles; not in consequence of the formation of the tubercles. The particulars in this case which appear to me the most decisive are,

1. The certainty derived from the information, both of the father and mother, who were questioned separately, and were both very intelligent and attentive, that the child had no pectoral symptoms, previously to the attack of measles, with the usual pneumonic symptoms, four weeks before death, but had suffered ever since then from cough, with some shortness of breathing.

2. The lungs being found, on dissection, studded with tubercles in their soft incipient state, chiefly contained in small cavities, which they did not completely fill; almost all of them surrounded with unusual vascularity, and slight condensation of the pulmonary substance.

3. The occurrence of tubercles, in the same state of forwardness, but not contained in vesicles, on a portion of the peritoneum, the bronchial glands, and on the pia mater; and their being equally, in all these places, surrounded with increased vascularity.

4thly, and chiefly, The incipient tubercles on the pia mater being closely contiguous to, of the same appearance as, and evidently connected with,

a larger and more irregular deposition of matter, which had the usual characters of inflammatory exudation on the pia mater,—which was connected with manifest effects of inflammation in the adjacent substance of the brain,—and which, if it had occurred alone, I think no one could have hesitated to call a product of inflammation\*.

#### CASE V.

W. C., æt. 21 months, of a scrofulous family, and of weakly habit, was subject to bowel complaints, but had no cough during the autumn of 1822, and winter succeeding. On the 16th February, he was suddenly seized with cough and febrile symptoms, which very soon became urgent. I saw him on the 20th, and at that time, and for many days after, he seemed to me manifestly in imminent danger, from inflammation of some part within the chest, denoted by painful cough, urgent dyspnœa, hot skin, and quick sharp pulse, with inability to lie on the *right side*. After repeated applications of

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\* The origin of the tubercles, in these cases, appears to have been very similar to what has been observed by Magendie, in his minute examination of phthisical lungs. At least, his observations tend to confirm the fact of tubercles, in this texture, frequently appearing, at first, in air-cells which they do not completely fill, and being, in the first instance, surrounded with vascularity.—*Journal de Physiologie*, t. i. p. 82.

leeches, blistering, and the use of a solution of tartar emetic, the febrile symptoms gradually subsided, and the dyspnœa abated considerably,—more than I expected, considering that the well marked pneumonic symptoms had lasted four days before the treatment was begun; but he continued subject to cough from that time till his death. When the urgent symptoms had abated, I discontinued my attendance, and the parents having neglected to attend, I did not see the child for several months. I learned afterwards, that although his appetite returned, he did not recover flesh; he continued very fretful, his bowels irregular, and fæces of very various appearance. In the course of the summer he became subject to pretty constant diarrhœa, with progressive and ultimately extreme emaciation. Towards the end of August he had much vomiting, and died on the 31st.

On dissection, the mesenteric glands were found very much enlarged, and of the usual cheesy appearance, but nowhere suppurated. There were a few ulcers, with elevated edges, and with some small tubercles about them, in the ileum, and the liver and spleen contained many tubercles of various sizes.

In the thorax, the left lung adhered partially, and the right lung very generally and closely to the pleura costalis, and to the diaphragm. Both lungs, but particularly the left, contained, both in their substance, and immediately beneath the pleura, a good many small tubercles, in nearly the same state of progress as in the last case, of a greyish-

white colour, and with somewhat of a pearly lustre; but the lungs were spongy throughout.

On examining the exudation on the pleura, which formed the intimate adhesions, it appeared to consist almost entirely of a very great number of small solid tubercular masses; in a few places only it had, to a small extent, the usual diffused form of an inflammatory effusion, and the matter composing this diffused effusion appeared to be identical with that which had the form of tubercles. The prolongations of the serous membrane dipping between the lobules of the right lung were studded with rows of these little eminences, and we had thus an opportunity of comparing them with the tubercles which lay in their immediate vicinity, beneath the pleura, and in the substance of the lung. They appeared to be of similar forms, and composed of precisely the same matter, excepting only, that those which were imbedded in the pulmonary substance were in general partially tinged of a dark colour, apparently by some of the usual black matter of the lungs\*.

Now, I do not pretend to give an opinion as to the cause of the formation of the tubercles in the abdomen of this child, which were evidently the occasion of his death; but, in regard to the appearances in the thorax, I think these, taken along with

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\* The tubercles on the pleura here described were examined by Dr Abercrombie, who found them to harden and become opaque on the application of boiling water, as usual in what he considers the incipient state of these bodies. See his Paper in this Volume.

the symptoms above mentioned, entitle us to conclude,

1. That there were tubercles in an early stage of their progress, beneath the pleura, and dispersed through the lungs.

2. That these tubercles were composed of the same matter, and formed in the same manner as the adjacent similar tubercles on the outside of the pleura, which united the pleura pulmonalis and costalis.

3. That these last tubercles were composed of the same matter, and formed in the same manner as the smaller more diffused effusion, which lay contiguous to them on the same surface of the same membrane, and assisted in forming the adhesions.

4. That both were, in all probability, the effects of the inflammation, known to have existed six months before death in this child's breast,—to have lasted long enough to produce much inflammatory exudation,—and to have caused inability to lie on the side where the adhesions were afterwards found.

The conclusion to which all the observations under this head seem to me distinctly to point, is, That in certain constitutions, inflammation of various textures tends to effusion of a whitish or yellowish matter, not in any considerable deposits, but chiefly in small circumscribed masses, more or less completely separated from each other, and that these are a common origin of scrofulous tubercles. Whether this kind of exudation differs from the



commencement in its nature, as well as its form, from the more ordinary effusion of lymph in consequence of inflammation, or whether the difference in the subsequent changes which it undergoes from those of more healthy effusions, depends on the subsequent state of the vital actions of the part where it is formed, is a point that remains for discussion.

II. The second set of cases which I have to adduce on this subject, consists of examples, in which children, previously in good health, or at least unaffected with any pulmonary complaint, have been seized with well-marked inflammatory symptoms, generally from a known cause, certainly adequate to that effect;—these symptoms have lasted some time, and been manifestly dangerous to life,—have subsided very imperfectly,—the children have passed into the state of phthisis, and died within a few months; and on dissection, tubercles have been found, in various stages of progress, but with little or no other appearance which could be considered either as the effect of the inflammation, *known to have existed*, or as the cause of death.

#### CASE VI.

J. S. æt. 5, a boy of ordinary stature, and pretty stout, but somewhat rickety, and with a small scrofulous sore on his leg, was attacked in the end of November 1815, with well-marked pneumonic symptoms. While these were recent, he was seen by

different medical men, who had no doubt of their nature, and he was bled twice at the arm, and used the other usual remedies, with very imperfect success; the heat of skin, febrile oppression, and dyspnoea, abated somewhat, but his breathing continued short, his cough very troublesome and dry; and he passed gradually into the state of perfect hectic, the rigors in the afternoons, and morning sweats, being unusually severe. He died, considerably emaciated, in the end of January 1816.

On dissection, the lungs were found of the natural spongy texture throughout, and the disease appeared to have been confined to the bronchial glands, which were enormously enlarged, and all converted into the usual cheesy or tubercular matter. There was no other disease in the thorax or abdomen.

#### CASE VII.

J. M., æt. 4, was attacked in February 1816, with pneumonic or severe catarrhal symptoms, at that time very prevalent among children, and of which I then saw several fatal cases, with dissections, in all of which there were evident marks of inflammation, and great muco-purulent effusion in the bronchiæ, and almost always more or less of hepatisation of some portion of the lungs. This child was treated by leeches, and the other usual means; the more urgent febrile symptoms were mitigated, but the cough and shortness of breath

continued ; he also passed into the state of distinct hectic fever, and died in May.

On dissection, the lungs were found completely studded with small hard white tubercles, none of which, however, were in a state of suppuration, nor was there any condensation of the pulmonary substance itself, or adhesion of the pleura.

#### CASE VIII.

J. R. a child of a scrofulous family, but previously healthy, was seized with hooping-cough by contagion, at the age of 4 months, in the spring of 1819. He had at first much heat of skin, and a good deal of dyspnœa even in the intervals of the fits of coughing. As the summer advanced, the heat of skin, and the characteristic mode of coughing abated ; but he continued subject to frequent cough, and very short breathing, and became gradually very much emaciated. He died at the age of 8 months.

On dissection, both lungs were found very full of tubercles, some of them larger than a pea. There was very little condensation of the pulmonary substance itself, but both immediately under the pleura pulmonalis, and in the substance of the lungs, there were many cavities, of various sizes, some nearly as large as a pea, containing *air*,—constituting the appearances described by Dr Baillie under the head of Enlarged Air-cells, and by Laennec under that of

Vesicles beneath the Pleura, more distinct and numerous than I have seen them in any other case. Some of these cavities contained air only, others were filled partly with air, and partly with the caseous matter of tubercles, very variously disposed in their interior,—and some of the solid tubercles, in the substance and on the surface of the lungs, had so exactly the same form as these vesicles, that it was impossible not to regard them as vesicles, in which the process of filling up with tubercular matter had been completed\*.

In several other dissections since that time, (as, for example, in Cases 2. and 4. above), I have seen the same appearance of cavities in the lungs filled partly with air, and partly with the matter of tubercles; and been convinced, that the filling up of such cavities is one mode in which the tubercles of the lungs are formed; but I have never seen the appearance so general, nor the cavities thus filled so large, as in the body of this child.

This particular appearance seems to me of peculiar importance, as fixing the date of the deposition of the tubercular matter. From the circumstance of some of the cavities containing none of it, and others being only partly filled, we may fairly conclude that its deposition was posterior to the formation of the cavities. And I believe it to be equally

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\* See Plate IV. Fig. 2., which is taken from a small painting of the appearance, with which I was favoured at the time by Mr Staff-Surgeon Schetky.

certain, that the formation of the cavities must have been posterior to the attack of hooping-cough, and the consequence of that disease. Laennec considers them as a consequence, though not an uniform one, of the emphysematous state of the lungs, which he describes; and adds, “ Je n’oserais assurer, que  
“ l’emphyseme du poumon ne puisse jamais exister  
“ sans toux; mais tous les malades chez lesquels  
“ j’ai rencontré cette affection étoient sujets à un  
“ toux habituelle,” (vol. i. p. 218.) “ The enlarge-  
“ ment of the cells of the lungs,” says Dr Baillie,  
“ cannot well be supposed to arise from any other  
“ cause than the air not being allowed the common  
“ free egress from the lungs, and therefore accumu-  
“ lating in them.” No cause is more apt to pro-  
duce this effect than the violent compression of the lungs by the convulsive actions of the muscles of expiration during the fits of coughing, while the bronchiæ are clogged with mucus, and the exit of the air impeded; and accordingly, this appearance, to a greater or less degree, is not uncommon in those who have died of hooping-cough, whether tubercles be found in their lungs on dissection or not.

The evidence in this case I consider, therefore, as nearly conclusive, that the tubercular matter was not deposited in these lungs till after the occurrence of the inflammatory disease, to which I have referred it.

## CASE IX.

E. T. æt. 2, slightly rickety, but not previously affected with any pectoral symptoms, was seized in the end of November 1821, apparently from exposure to cold, with febrile symptoms, and severe cough, which soon took very nearly the form of hooping-cough; but as it was not communicated to other children in the family, I think it could not have been that disease. This child was not seen for nearly three weeks after the pectoral symptoms had commenced; and the remedies used after she was seen had but little effect. The cough and short-breathing continued,—she grew very emaciated, had profuse sweatings, and died on the 25th March, after an illness of four months.

On dissection, both lungs were found very full of tubercles, some of which were nearly of the size of a hazel-nut, and some were in a state of suppuration; and in the lower parts of the right lung there was a large irregular cavity, lined with cheesy matter, formed apparently by the suppuration of several tubercles that had coalesced. In the left lung there was a good deal of induration of the pulmonary substance, but very little in the right.

In this case, the tubercles had passed into a state of suppuration more completely than in any of the others; but in all the three last cases, I am confident that the space occupied by the tubercles in the substance of the lungs was as great, and the portion

of lungs that could have been useful in breathing, therefore as small, as in most cases of phthisis.

I have given these cases, because particular circumstances led me to take short notes of them at the time when they occurred; but I have seen several others, the leading particulars of which were just the same; and I think I can say with confidence, that among the children of the lower orders in this town the case is not a rare one. A healthy child shall be seized suddenly with well-marked pneumonic symptoms, either from cold, or from the contagion of hooping-cough or measles. The symptoms shall be such, as to justify a confident expectation (founded on dissections of children dying in the height of such affections, of which I could produce many examples) that if speedily fatal, they will leave behind them the indications of active inflammation. The urgent danger shall be got over, but the cough and shortness of breath shall continue with progressive emaciation and debility, till death takes place, at the end of some weeks or a few months; and on dissection, there shall appear tubercles in great numbers, and sometimes of a pretty large size, with no condensation of the pulmonary substance, or only a slight condensation of it, just about the tubercles.

I am aware, that in young children, it is very difficult or impossible to judge from the symptoms, for a time, whether the substance of the lungs is inflamed, or whether there is only an unusually extensive and acute inflammation of the bronchiæ. But when the

cough and dyspnœa draw out long, and the child becomes gradually emaciated, and dies at the end of several weeks or months from the accession of the pneumonic symptoms, I believe that some change of the texture of the thoracic viscera is uniformly found on dissection. I have seen more than one case strongly illustrating those above detailed, where, from the long duration of severe pectoral symptoms, in young children, and the gradual emaciation, I have expected to find the scrofulous tubercles, but in which the diseased state found has been hepatisation merely. In one remarkable case, of a child of 18 months, who had been ill two months with cough and short breathing, was extremely emaciated when I saw her, and died in three days after, not less than two-thirds of both lungs were completely hepatised, but there were no tubercles. The course of the symptoms, however, was so exactly similar to that of the cases above described, in which tubercles formed almost the only morbid appearance on dissection, that I cannot persuade myself that, in the one case, the symptoms depended on, and in the other were independent of, inflammation.

In drawing conclusions from such cases, I do not lay much stress on the circumstance of the patients being previously healthy, though, in several instances, I am confident that this was strictly true. What I chiefly rely on, is *the certainty* of inflammation *from a known external cause* having existed, some weeks, or a few months only, before death, and the patient having been in great danger



from it, *and never having recovered* from the symptoms of it; and the numerous and advanced tubercles being the chief or *only appearance* found on dissection;—and the question is, Whether we are to believe that the inflammation caused the tubercles; or that the inflammation, which certainly existed so recently, and the chief symptoms of which never abated, but went on uniformly to the end, did not cause death, nor leave any consequences perceptible on dissection, but merely co-existed by chance with another affection previously existing, and which ran an independent course?

I have seen several cases which induce me to think, that a part of the deaths in young children, which are referred to the head of *tabes mesenterica*, bear just the same relation to the more acute and quickly fatal diseases of the intestines, as such deaths from *phthisis* do to those from *bronchitis* or *pneumonia*.

The most common cause of the symptoms generally described under the head of *Febris Infantum Remittens*, (in the more serious cases of that disease), is inflammation, going on to ulceration, of the mucous membrane of the intestines; and the modes in which this proves fatal, are various in different cases. The most rapid mode is by sudden conversion into affection of the head, which frequently but not uniformly takes the form of *hydrocephalus*. This point is fully illustrated by the writings of several recent British authors. In several dissections, where this had been the course of the symptoms, I have found

the mucous membrane of a part of the intestines somewhat inflamed and ulcerated, the edges of the ulcers generally elevated, and apparently composed of inflammatory exudation of lymph, and the mesenteric glands next to that portion much swelled, and of a dark red colour, both externally and internally.

In other cases the disease takes the form of continued fever, with obstinate pain of abdomen, and generally a loose state of the bowels, though without tenesmus or discharge of blood; and when this form of fever is fatal, the appearances in the intestines and mesentery just now mentioned, and which are described by several French authors under the title of *Fievre Entero-mesenterique*, are, so far as I have observed, very uniformly found.

In a third set of cases, where the symptoms in the beginning are just the same, but draw out for a much longer period, and pass into the form of chronic diarrhœa, generally with a tympanitic state of the abdomen, dry harsh skin, and progressive emaciation, the appearances found on dissection are, in like manner, ulcers in the intestines; and swellings of the mesenteric glands; but in these cases, the substance of the enlarged glands, and very often also the edges of the ulcers, are of the peculiar matter of tubercles\*.

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\* It is by no means asserted, that this is the only, or even the most common way, in which the disease of the mesenteric glands begins, but only that it is one way.

On comparing together the symptoms, and the appearances on dissection, in these different cases, I think it is difficult to resist the conclusion, that the disease of the bowels is in the first instance the same in all, and probably originates in the mucous membrane; that it takes a different course in the last set of cases, only because the constitution is scrofulous, and the inflammation excited in it chronic; and that the tubercles found on dissection are not the original cause of the symptoms, but the consequence of that chronic inflammation.

If it be said, in answer to all that has now been stated, that in all these instances, the febrile and inflammatory diseases, from which the tubercles found on dissection appeared to proceed, did not cause them, but only greatly accelerated the growth of tubercles already existing, but very minute, and not affecting the health; I would answer, *first*, that I have already pointed out several circumstances connected with some of the cases, (particularly Case 1, 2, 3, 4, 5, and 8,) which seem to me quite incompatible with that supposition; and, *secondly*, that if it be allowed that inflammatory diseases have the power to produce *such an acceleration* of the growth of tubercles, as must have been effected in the second set of cases above detailed, the question as to their *actual origin* seems to be divested of all practical importance. It can signify very little in practice, whether we believe that inflammation has the power to *generate tu-*

bercles in certain constitutions, or only believe, that it has the power *so to accelerate* their progress, as to make them dangerous, and fatal within a few weeks, or months at the most, when they would otherwise have been harmless.

I have no doubt, therefore, that it may be safely stated as a general principle, that the frequent excitation, and rapid acceleration of tubercles, by inflammation, is the great practical limit to the use of the tonic remedies and regimen in scrofulous habits.

It is true, that in the course of scrofulous inflammation and ulceration, and probably even during the growth of tubercles, various articles of the tonic regimen may sometimes be used with good effect, the patient suffering more, as it would appear, from the peculiarity of his constitution giving a peculiar obstinacy to his local disease, than from the intensity of that disease; and I believe it is only by cautious trial in each individual case, that the practitioner can satisfy himself how far this principle may be acted on with safety and advantage. But if the preceding statements and reasonings be correct, it is clear that after scrofulous disease has fairly shewn itself, this plan is always met by contra-indications, and must be acted on, therefore, with much more caution,—with more interruption,—and indeed often interposition of opposite remedies,—to a less extent,—and, if the disease involve affection of the whole system, with infinitely less prospect of ultimate success, than it might have been, while the ac-

cession of scrofulous disease was only a probable contingency; and I am confident, that the experience of the most intelligent physicians will confirm this observation. The importance of using all means of counteracting the scrofulous tendency, where it is suspected to exist, *while it is still safe to use these means with effect*, becomes much greater when we are convinced, that after scrofula has unequivocally shewn itself, *it can seldom be safe* to use them to the extent that is requisite to make them effectual.

In giving advice with a view to the prevention of diseases, a medical man labours under a disadvantage the very opposite of that which is so apt to mislead his judgment in regard to the usefulness of the remedies he employs for their cure. In the latter case, the object of his wishes is so frequently accomplished under his eyes, and during his exertions, and so generally ascribed to his skill, that he is always in danger of overrating the value of his services, and the amount of the positive experience which he acquires of the efficacy of his remedies. But in the former case, as the most he can hope for is a merely negative result, he cannot expect that the importance of his advice can be duly appreciated by those who receive it; and he is in danger of underrating, in his own mind, the amount of the benefits he can thus confer on society, unless he has been at pains to satisfy himself, by such inquiries as those to which I have ventured to direct the attention of my colleagues, of the nature and

extent of the danger he proposes to avert; of the evidence which experience, on a large scale, furnishes of the general efficacy of the means of prevention which he recommends; and of the limits which the nature of the diseases to be averted imposes on the use of these means.

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*Explanation of Plate IV.*

Fig. 1. represents the diseased portion of Pia Mater described in Case 4.

*a*, The diffused effusion of lymph, lying chiefly over the course of a large vessel.

*b*, The ulcerated spot, which communicated with the broken down portion of brain.

*c*, Effusion intermediate between the diffused and tubercular form.

*d d*, Effusion wholly tubercular.

Fig. 2. represents a portion of the diseased lung described in Case 8.

*a*, Vesicles beneath the pleura filled partly with air, and partly with tubercular matter.

*b b*, The same appearance, in sections of the lung. The tubercular matter is partly disposed as a lining to the inside of the cavities, partly in irregular masses in their interior.

*c c*, Tubercles apparently formed by the filling up of these cavities.

C A S E  
OF  
INFLAMMATION OF THE CEPHALIC VEIN,  
WHICH TERMINATED FATALLY ;  
WITH THE  
APPEARANCES ON DISSECTION.

By ANDREW DUNCAN *jun.* M. D. Professor of Materia Medica in the University of Edinburgh, President of the Royal College of Physicians, and F. R. S. E.

(*Read April 2. 1823.*)

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ON the evening of Wednesday the 19th March 1823, I was called to visit Mr A. a professional gentleman, twenty-eight years of age, and of a sanguine temperament. I found him in bed, with his left hand very much swollen, red and painful, as if affected with *Erysipelas phlegmonodes*. On the knuckle of the fore-finger there was a sore, resembling the remains of a blister or opened phlegmon. There was also some swelling, though inconspicuous.

siderable, of the wrist and fore-arm, but no redness. His pulse was 120, and full; his countenance appeared livid, and his respiration was short, frequent, and interrupted; his tongue furred, and he had considerable thirst. He made, however, little complaint, except of flatulence; said that the affection of his hand, which he had been treating with poultices, was declining; denied having any pain in his breast, and, although on being desired to take a full breath, he did not make a deep inspiration, he alleged that this mode of respiration was natural to him. On questioning him as to the history of his affection, I could learn little from him at that time; but on my suggesting, that, from the appearance of his hand, I was afraid he had hurt himself in dissection, he assured me that it was not the case, and that he had not been exposed to such a cause of disease for a long time. He even said he had no recollection of any injury done to his knuckle, unless he had hurt it when walking in the country on the Saturday preceding. He appeared very much distressed and agitated, but in no way alarmed about himself; and as I knew that he had been lately much harassed, I ascribed great part of his present state to moral causes, and did not at this time push my inquiries to the utmost.

I afterwards learned, partly from himself and partly from his landlady, the following circumstances:—On the Saturday preceding, Mr A. had dined abroad in perfect health. On Sunday morning, he ordered the servant to grind some coffee for



his breakfast, which he was in the habit of preparing himself, and as a reason mentioned that his hand was sore. In the evening, he made some complaint of being cold, and bathed his feet in hot water before going to bed. On Monday evening, his landlady saw his hand for the first time, and observed a small boil on the knuckle, which she described as having a considerable hard inflamed base, with a little suppuration in the centre. She advised him, as the usual method of getting rid of such boils, to squeeze out the matter strongly; but it would appear that he opened it with a lancet, which he afterwards confessed he had employed four weeks before in laying open a carbuncle. Mr A. had for some time past been much occupied in making preparations for a large musical party on Tuesday evening. He was now advised to postpone it, but would not consent at this time, as he said his hand would be well enough to enable him to receive his friends. When the Tuesday came, however, he at last became sensible that all idea of his party must be relinquished, and he exerted himself to the last moment in writing and dispatching cards of apology to those friends whom he expected. This was a severe mortification to him; and it should be mentioned, that, for a week or more before his illness commenced, he had undergone great fatigue, and had experienced considerable mental anxiety, and not a little disappointment. During the winter he had studied very hard, both sitting up late and rising early.

At this first visit, he was only advised to continue the poultices, and take a solution of sulphate of magnesia, with tartar emetic.

On Thursday morning, I found him apparently much better, his breathing free, and his countenance more natural; his pulse down to 80, and without any febrile irritation. He seemed also more composed, and the affection of his hand was subsiding.

During this day, his arm was kept constantly wet with a cold lotion, containing acetate of ammonia, and he drank freely of orange juice and water, which brought on frequent watery purging, for which he had taken some laudanum, with the effect of moderating it.

In the evening, I found him with a considerable exacerbation: his pulse was again 120, febrile, but not full; and the swelling, though with little redness and no pain, was extending slowly up the forearm.

On Friday morning, instead of the remission which I hoped would have taken place, as on the preceding day, I found the fever in no degree decreased: he had passed a restless night, although he had taken some more laudanum of his own accord. The swelling was still making slow progress up the arm, but was not attended with redness or pain. In the evening of Friday, I got a hurried message before the usual hour of visiting, and found Dr Kenney with him, to whom he had also sent, complaining that he had not visited him during his illness. He had also sent for his friend Dr R. Ha-

milton to bleed him, having had some hæmoptysis in the course of the day. He was now looking extremely ill,—the sore seeming irritated,—the hand and fore-arm much swollen, and one or two red streaks running up from the elbow to the shoulder in the course of the cephalic vein,—respiration again much affected,—breathing quick and short, but he denied having any pain in the chest. He was frequently troubled with cough, but did not expectorate much, and his sputum was tinged with blood. Countenance anxious, depressed, and of a leaden-hue; features sharpened, and the eyes sunk and dull; skin not very hot. Tongue foul; thirst inconsiderable. Pulse 110, neither strong nor sharp. A vein was opened in the right arm, and  $\zeta$ xvi. or  $\zeta$ xviii. of blood taken, which proved to be cupped and buffy; the pulse fell to 96, but no other salutary change was perceptible, except that a slight headache, of which he complained, was relieved. Dr H., who remained with him, learning that he had taken scarcely any nourishment since the commencement of his attack, gave him some light supper, which he took with apparent relish. In the night, Dr H. was again sent for, on account of wandering pains in the stomach, evidently the effect of the flatulence of which he had all along complained.

On Saturday morning, we found that he had had a restless, sleepless night; all the symptoms aggravated; pulse 120; the swelling extending up the arm, of an uniform appearance, with a defined margin, but still without much redness, heat, or pain,

unless in a point at the bend of the arm, on considerable pressure, and on the outside of the elbow. No swelling of the glands of the axilla could be perceived, nor any tumefaction of the pectoral muscles. In consultation, we agreed that twelve leeches should be applied to the diseased arm; that an emollient enema should be given, as he had had no stool since the purging had ceased, and that he should get light nourishing diet. The enema brought away some formed, but sufficiently healthy, fæces, and the leeches were applied about noon.

In the evening he was decidedly worse. The bleeding from the leech-bites had not stopped, and some slight means, but at the time deemed sufficient, were used to suppress it. Pulse 120, of tolerable strength,—some *subsultus tendinum*,—transient delirium,—swelling extending up the arm, though not considerable, and without that boggy feeling characteristic of cellular inflammation,—but still he made no complaint of pain, nor expressed any apprehension for the result; and as he had had no sleep for several nights, we agreed to give him a full dose of laudanum, hoping that this would produce a decided effect.

In this, however, we were disappointed. The early part of the night was restless and agitated, and about two in the morning, this gave place to a heavy wandering and sinking state. This occasioned alarm to the attendants, and at 4 A. M. Dr H. was sent for, who found him apparently dying,—the blood to a considerable extent still oozing from

the leech-bites, even from those that had been quite staunched before. Pulse 140, and very feeble. Dr H. immediately proceeded to stop the hæmorrhage, which he quickly effected, but not until the pulse had become nearly imperceptible at the wrist.

He remained still sensible, though drowsy. A cup of arrow-root, with Madeira wine, was given,—hot bottles were put to his feet, and friction applied to his limbs. This was followed up in quick succession with wine, glass after glass, but without any rallying,—the breathing became more sonorous, oppressed, and tardy,—the aspect more cadaverous, the extremities more cold, and the intellect more clouded,—till at length, just before death, its aberration was decided. Conceiving himself well, he wished to get out of bed, to transport himself to his own home, and, after a short and a feeble effort, he lay down exhausted, and soon expired, about eight on Sunday morning, without a struggle or a groan.

The body was examined twenty-four hours after death by Dr Molison, in the presence of Dr R. Hamilton, Dr Kenney, and myself.

The chest was first opened; the skin and muscles covering it were perfectly healthy. The cartilages of the ribs on one side were more ossified than is natural in so young a man. General adhesion of the lungs to the costal pleura, pericardium, and diaphragm, and among the lobes, above and behind by old adhesions, but in every other part by a recent effusion of coagulated lymph, which fringed the edges of the lobes. The lymph was observed in

greatest quantity round several spots of condensed livid lung; and on one part on the right side, where inflammation seemed to be most intense, it communicated to the opposite costal pleura, and in appearance exactly resembled ecchymosis. In the centre of this part, upon the *pleura pulmonalis*, there was a small quantity of thick fluid, of a pink colour, about the size of a sixpence: the coagulated lymph appeared in the state of torn shreds immediately around this spot, but at a little distance it became united, and formed a dense coating, easily separated into layers. The substance of the lungs beneath this part was of a dark vinous colour, and did not at all crepitate when cut. But within this hardened mass there were two portions contiguous to the pleura, each nearly as large as the point of the thumb, which had become soft, and had lost all elasticity, so that when gently pressed by the finger their fibres were easily torn. In short, they greatly resembled a part affected with gangrene, but they had no smell. Several smaller portions on the surface of the lungs were observed to be of the same colour, and were in a semi-hepatised state, but none of them contained any softened part. In the left side of the chest, there were six or eight ounces of a brown-coloured fluid, contained in a circumscribed cavity formed by the adhesion of the pleura. When freed from their adhesions, the lungs generally did not collapse, but remained full and tumid. When the substance of the left lung was cut into, it was crepitous, but contained a large quantity of

frothy serum, which could be expressed. The right lung was also crepitous, and greatly gorged with serum, with a very slight intermixture of spumous matter, which flowed freely from incisions made into it. The third lobe was filled with blood apparently from congestion after death. No part of the lungs was found to sink in water, but some small portions descended further than healthy lung does. Some old adhesions were observed, particularly at the top of both lungs, which gave these parts a puckered appearance. Within were found several tubercles, and on the left side one as large as a nut, containing in a sac a yellowish purulent-looking fluid. On the right side, also, contained in dense cartilaginous sacs, there were two tubercles of a curdy appearance, with calcareous particles in each, and in the left lung there were *calculi*, not connected with tubercles. The other viscera, so far as they were examined, appeared healthy.

Many livid spots were observed externally on the left arm; and on the back of the hand of the same side, between the heads of the metacarpal bones of the first and second fingers there was an ulcer, around which there was an evident swelling of the cellular substance, extending more or less up the whole arm. On making a long incision from this ulcer to the top of the shoulder, a small abscess seemed to be laid open at the bend of the arm, but it proved to be the cephalic vein which had been divided, and was full of purulent matter. The vein was now traced with more care, which, from its increased size and

solidity, was easily done, and we found that the veins coming from the back of the fore-finger, middle and ring fingers, were all diseased; but that from the little finger was healthy. The morbid state of the vein extended upwards along the whole course of the cephalic to its termination in the left subclavian, which remained perfectly healthy. The disease of the vein consisted in external redness, arising from the increased size of the *vasa vasorum*; thickening of all its coats, so that it remained like an artery, round without collapsing; increased size, especially in the fore-arm; its containing no blood in any part of its course, and being generally filled with purulent matter, except in a few places, where it seemed empty; and in the inner coat being everywhere red and thickened. On the back of the hand, it appeared as if matter had been formed in the cellular texture itself; but upon more minute examination, it was quite evident that it existed solely within the veins. Throughout, the cellular and muscular texture of the arm were almost healthy and natural, even in the immediate vicinity of the diseased parts of the vein; but towards the end of the dissection, a considerable quantity of serous fluid was observed to have escaped from the divided tissues.

I think we are entitled to consider this as a pure example of death solely from inflammation of the vein, although there were peculiarities observed which ought not to be altogether overlooked.



The state of the lungs showed considerable pulmonary affection, both recent and of some standing, and we may infer that Mr A. could not have survived many years, from the progress which tuberculous consumption had already made. It may be a question whether this diseased state of the lungs contributed in any way to the fatal event, or at least to accelerate it. Even at my first visit, I was struck with the livor of his countenance, and the diseased mode of his respiration; and although both became less evident during the following day, yet, on the aggravation of his complaint during the Friday, they returned, and were particularly noted by Dr Hamilton, who then first saw him, and to whom I am indebted for many of the particulars of the history of the last hours of Mr A.'s life, as he attended him with the most unremitting kindness till he expired. Immediately before death, the respiration was also much affected. Still, however, I am not of opinion that the affection of the lungs was the immediate cause of death, or that it even contributed much to aggravate his complaints. The effusion into the air-cells, which alone I think could have had that effect, I consider to have taken place chiefly after he was moribund; because, although he might not at last have strength enough to expectorate, yet, in the first days of his illness, and when he could get out of bed without assistance, he had not much cough, and did not feel any call to expectorate. The slight hæmoptysis on Thursday was evidently connected with the broken down

spot in the right lung; but this, also, was not considerable enough to cause death; and, lastly, the general inflammation of the surface of the lungs, we may conjecture, was not very acute, as at no period did he complain of pain, even when urged upon the point. The pulmonic inflammation may have been present in some degree before the disease of the vein, as he was much exposed to causes likely to induce it. In this point of view, it may have operated as a cause predisposing the other organs or structures of the body, and of course the vein, to inflammation, when an exciting cause should be applied.

On the other hand, it is probable, that the recent pulmonic affection, if previously present, was aggravated, and if not, was excited by the diseased state of the vein; for, in numberless instances in our late epidemic fever, we have had occasion to observe, that, when a general disease was excited, those organs in which there existed any predisposition to disease suffered the most; and we may therefore suppose in this case, that when the general typhoid fever was excited by the inflammation of the vein, the lungs were disposed to feel its influence; hence the pleuritis affecting the whole surface of the lungs, —the *apoplexia pulmonalis* of some parts,—and, lastly, the effusion shortly before death.

Again, it is not necessary to resort to the pulmonic disease, to account for the speedy termination in death; for experience has shewn but too certainly, that inflammation of a vein, when considerable, often cuts off the affected person in eight days.

In regard to the nature of the affection of the arm, although at first, and when confined to the back of the hand, it had much resemblance to what is often called Erysipelas; yet its appearance in the more advanced stage, and still more the dissection, shewed that the cutaneous texture was not the seat of the principal disease. Even at the first, the swelling was much more considerable than in pure erysipelas; and except that it was diffused, it had more the appearance of phlegmon. In fact, it had most resemblance to an anasaruous hand, but I do not remember that it pitted. It differed also from erysipelas, in the absence of tenderness on being touched, which in general is exquisite, when the skin is the seat of active inflammation. Nor was the affection entitled to be considered as *Erysipelas phlegmonodes*, or inflammation of the cellular texture simply, although this was my opinion until dissection proved the contrary. But now upon reflection, and a comparison with undoubted cases of inflamed cellular substance, some diagnostic characters may be pointed out; especially the very remarkable absence of all pain, even upon pressure, unless over the course of the vein, and the patient's feeling no great inability to move the limb, and not being distressed when it was moved; and, lastly, in the apparent slightness of the symptoms. There was, however, it must be admitted, an increased action of the cellular substance of the whole limb, at least in that degree which causes an increased effusion, not of pus or coagulable lymph, as when decidedly

inflamed, but only of serum, such as accompanies all inflammation of a neighbouring texture; and hence that fulness and tension of the limb, which assisted in preventing us from discovering the real nature of the affection. During the life of the patient, and indeed previous to incision, there was little appearance of the vein being the chief seat of the disease, if we except the red streaks running up the arm, and the tenderness being confined to those places where the vein was most superficial; but although the arm was repeatedly and carefully examined by myself and my medical friends, no longitudinal ridge was observed, nor was any cord felt running under the skin.

Perhaps the most important point of inquiry is in regard to the actual exciting cause in this individual instance. That it was connected with the phlegmon upon the knuckle, there can, I think, be little doubt. The veins of that part, and those immediately anastomosing with them, were the most diseased. Indeed, every twig was there thickened and filled with pus, so that at first the pus seemed to be in the cellular substance; but on accurate examination, it was ascertained to be contained exclusively within veinous branches. But veinous inflammation is not a common attendant, or consequence of phlegmon, and some other cause must be looked for as contributing to the effect. The only circumstance of this kind known to me, was Mr A.'s having opened on the Monday evening, as far as we can make out, the boil on his knuckle with a lancet, and that

he had made use of this lancet about a month before in opening or dilating a sore upon the back of a patient. This individual is still alive, and upon examination I find that he had been affected with carbuncle, which healed slowly after being laid open. Mr A. assured me that he had cleaned the lancet after it was used; but added, that it might be the cause of the soreness of his hand, as he remembered that he had hurt his nose with it, which had in consequence been very sore; but when I saw him, there was no appearance of sore upon his nose remaining.

If the use of this lancet was the immediate exciting cause, this case furnishes an argument that the morbid secretions of an ulcer may act as a poison upon the system of another individual, when introduced by inoculation, although not fatal to the individual by whom it is secreted; and of this many other examples might be adduced. Under this supposition, it would also prove that such morbid secretions may act, although applied in a very minute quantity, since we may be assured that a lancet, which a gentleman would employ upon himself, would at least seem clean; and, lastly, it would prove that such a minute quantity of morbid poison retains its activity for about a month at least.

But even granting that the lancet was loaded with a morbid poison capable of inoculating the system, it appears to me highly improbable that opening with it the cavity of a small abscess would have this effect. In general, when a phlegmon points, and especially after it has burst, the outer parietes

are thin, and possessed of but little vital activity. Indeed, it seems to be the natural process, that the top of a phlegmon should die, and give way to the distending cause within. There also can be little doubt that phlegmons are not unfrequently opened by foul lancets, and yet such accidents as this have not been observed. In fact, the affection which most frequently arises from applying morbid animal matter to a broken surface, is not inflammation confined to the venous structure, but inflammation of the cellular tissue, as I shall endeavour to shew in a future communication.

Upon the whole, I am disposed to think, that Mr A., in opening the boil on his knuckle, had unfortunately penetrated a vein situated beneath it; and perhaps it is as probable that he had inoculated himself with matter from his own body, as that the lancet which he had wiped apparently clean, should have remained so long contaminated.

In another fatal case of inflamed vein, complicated with diffuse cellular inflammation, which was partly under my care, death did not take place until the thirtieth day, and then in consequence of sphacelus of the nates. Its history, with the appearances discovered on dissection, will be given in a subsequent communication.

C A S E  
OF  
DIFFUSE INFLAMMATION  
OF THE  
CELLULAR SUBSTANCE OF THE SIDE,  
FOLLOWED BY A SERIES OF UNCOMMON SYMPTOMS,  
AND TERMINATING FATALLY;  
WITH THE  
APPEARANCES ON DISSECTION.

By ANDREW DUNCAN *jun.* M. D. Professor of Materia Medica in the University of Edinburgh, President of the Royal College of Physicians, and F. R. S. E.

(*Read 2d July 1823.*)

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MRS CRAIG, aged thirty, was admitted a patient into Queensberry House Hospital, 2d September 1821, supposed to be affected with fever. She complained of severe headache; pain of the loins and breast, the latter aggravated by pressure, and on taking a full inspiration; nausea and great inclination to vomit. Pulse 128, full and bounding.

Tongue very foul and loaded; bowels costive; heat 102°; face flushed; eyes suffused.

She had been seized three days before with headache, nausea, vomiting, and rigors, while employed at harvest-work, and ascribed her complaints to cold. She had been *bled*, and had used opening medicines without relief. About eighteen months before this time, she had been infected with syphilis by a child she suckled, and one of her breasts had suppurated. She took mercury, and was supposed to be cured; but about three months before her admission into the hospital, she was delivered of a still-born infant, suspected to have been syphilitic.

Sept. 3. She received great relief from the abstraction of twenty ounces of blood, which separated a buffy coat, and her bowels were freely opened; but she passed a very restless night, and complained of severe pain of the right shoulder, stretching down the breast, and preventing free respiration. The parts affected were much swollen: she had slight nausea, and inclination to vomit. Pulse 112, pretty full and strong. Tongue loaded and tremulous. Heat 103°; face flushed; eyes suffused; great thirst.

When this woman was admitted, she was considered as affected with continued fever, excited by unusual exertion and exposure to heat and cold, when employed in reaping. For a day, the fever was supposed to be pulmonic; but it soon appeared that the lungs themselves were not affected, and that the seat of the local complaint was the right arm, and the soft parts on the right side of the thorax. I was at the



time struck with the resemblance of the symptoms in some respects to those which I had seen from venesection; but as in this woman the lancet-wound had healed by the first intention, I was disposed to think that the swelling and pain depended upon a tendency to form what are called critical abscesses; and the antiphlogistic treatment, general and local, was followed. Twenty leeches were applied to the shoulder, which bled freely, with great relief to the pain. In the evening, she continued to complain of nausea, and inclination to vomit; and an emetic was exhibited, which operated freely, with every appearance of a loaded stomach.

4th.—Very restless night, with frequent retching. The swelling and tenderness of the shoulder were much diminished; but she complained of a sense of tightness across the chest, preventing free respiration. Pulse 130, full and strong. Tongue loaded and tremulous; face flushed; thirst very urgent; bowels very free. Thirty ounces of very buffy blood were drawn with great temporary relief to the dyspnœa, and a blister was applied, which rose and gave very great relief.

5th.—Some sleep; much less pain of shoulder, but had nausea and inclination to vomit; bowels very loose. Pulse 116, less full. Heat 100°. Tongue foul and tremulous. She got effervescing draughts, and was allowed some grapes to quench her thirst.

6th.—Better night; nausea much abated; but she had still pain of the arm increased by pressure

or motion. Pulse and heat 100. Tongue clean; bowels free.

Two ounces of port wine were now allowed her, to be taken from time to time in the form of negus; but after getting a little of it, she became delirious, and talked incoherently; her pulse rose to 116, and became full and strong, and her face was flushed. The wine was immediately discontinued, as it seemed to be the cause of this over-excitement; and I have often remarked, that fever patients who have been treated by free depletion, do not bear stimuli.

7th.—Pretty quiet night, but nausea and pain of arm. She has frequent frothy stools, with tenesmus. Pulse 114, less full. Heat 102°; great thirst, with bad taste of mouth. Tongue cleaning. A starch glyster was administered.

8th.—Pain of side prevented free inspiration. Twenty ounces of blood were drawn with considerable relief, and the blood was buffy, cupped, and separated much serum.

9th.—Good night, and no complaint except of pain of arm and side; stools numerous, fetid, and still a little frothy. Pulse 106, and less full. Heat 100°; thirst continues. Tongue clean; countenance much improved.

She got a bolus of calomel and jalap, which produced several natural stools.

On the 10th, 11th and 12th September, corresponding to the thirteenth, fourteenth and fifteenth days of her illness, she had little complaint, and was considered convalescent; but upon the 13th of

September she had a fresh accession of fever, with more evident local affection; complaining of severe pain of the right side, increased on pressure, which was much swollen and hard; a tumor about the size of a pigeon's egg was also observed above the right clavicle, which, however, gave her no uneasiness on pressure. Pulse 120, full. Tongue pretty clean; some thirst.

This accession was relieved by venesection, and she was again thought to be convalescent, although the formation of an abscess on the side was anticipated.

On the 19th September, she had another accession of fever and pain, and was again relieved by venesection.

On the 1st October there was a slight, and on the 6th a very severe accession, which was at first a little relieved by warm fomentations, but afterwards recurred with great severity. Pulse 120, full and strong. Twelve leeches were applied, and afterwards fomentations, with good effect.

Upon the 8th, it was again thought necessary to apply twelve leeches, on account of the pain of the left side, increased by pressure or motion, and cataplasms were also employed.

On the 11th, the tumor which had been observable upon the right side for about a month past, was reported softer, and for the first time slight cough, with copious easy expectoration, was mentioned as a symptom.

I suspect that at this time the purulent matter which had formed in the cellular substance of the

parietes of the chest external to the *pleura costalis* had, by adhesion and erosion of that membrane, found its way into some of the bronchia, and that in fact it was this pus which constituted the copious, easy expectoration discharged by slight cough. This idea of a communication between the external abscess and the pulmonary passage was confirmed on the 14th, when it was reported that the tumor on the sternum crepitated. The fluid was now expectorated, and air occupied its place. On the 15th, by the progressive evacuation of pus, air had entered into other tumors of the right side; distinct crepitation was perceptible on handling them, and a gurgling rattling was heard when the patient breathed. On the 16th, it was reported that the cough was very severe, without expectoration; emphysematous tumor on the breast increased in size, and the tumors on the side softer. By the assistance of a stethoscope, the respiration was audible in the left side of the thorax, especially on deep inspiration, and accompanied on coughing by considerable rattle, as of air passing through fluid; pulsation of the heart also audible; and, about the middle of the sternum, there was something like egophony; and on the right side, air was heard rushing into all the tumors, with very distinct pectoriloquism in that on the neck above the clavicle, and in the other upon the sternum. The expectoration was much diminished on the 15th, and altogether suppressed on the 16th and 17th, and the patient was dreadfully oppressed with dyspnœa, when immediately after the visit on

the 17th, and before I had left the Hospital, I was suddenly called to her, and found that she had just brought up at once about three pounds of pure thick pus, like thick yellow cream, unmixed with froth or mucus, shewing that it had not been diffused through the cancelli of the lungs, but had made its exit through a bronchial tube as through a fistula.

Before this time, I had wished to make an external opening into the abscess, having observed that the patient was very much oppressed whenever the expectoration was less abundant, and dreading that although hitherto it was readily ejected, it might very easily cause suffocation. A lancet was accordingly plunged into the tumor on the side, on two several days, by my assistant Dr Macredie, but without success. An opening was, however, made by Mr Wishart on the 21st, and, as I had anticipated, not only pus was discharged by the wound, but also a blast of air, as was proved by its effect on the lighted candle I had ordered to be prepared for the experiment.

Sept. 22.—Slept very well, and thought herself much better in every respect; cough continued, and about two ounces of purulent matter were expectorated this morning. Emphysematous tumor on the sternum much diminished in size, and the air it contained could be pressed into the thorax, but immediately returned on removing the pressure. The mamma was also elastic, as from air beneath it, confined by thickened margin, and there was a small em-

physematous tumor in the neck, in which pain was felt when she coughed. On removing the plug from the wound, ten ounces of pus were discharged, the tumor on the sternum entirely subsided, and that on the neck was very much reduced in size. The plug was again removed in the evening, when eight ounces of pus were discharged.

For some time after this, the daily reports differed only in the quantity of pus discharged when the plug was removed, and the increase or diminution of the tumors according to circumstances, with little variation in the other symptoms. After the external opening was made, she soon brought up no more pus by expectoration, except a very little on the 3d November. The quantity discharged by the wound varied during the latter days of October from 10 oz. to 20 oz. In November it became less; on the 18th, it was reduced to 4 oz. and on the 20th to 1 oz., after which it entirely ceased. On different days, it seemed to come from different cavities, according as their communication with the external orifice was open or obstructed. On 7th November, pain in the axilla was excited by cough, and the pus next discharged seemed to come from under the axilla, and above the wound, after which the pain ceased. On the 9th, she had pain behind the lower bone of the sternum, preventing full inspiration; and when the plug was removed, air escaped along with the pus, and was forcibly expelled by the act of coughing.

On the 12th, it was observed that the pus discharged came from behind the wound, and air from

above it; their relative situations being according to their gravity.

On the 15th, an attempt was made to lessen the suppurating surface, by procuring the adhesion of the sides of the sac by pressure; but it was obliged to be discontinued, in consequence of the severity of the cough it excited.

On the 10th, however, after enlarging the external opening, the pressure could be borne, and from this time the discharge diminished rapidly. She had smart rigors on the 17th; diarrhœa set in on the 19th, requiring the use of opium, and hectic fever was established.

On the 29th, the wound was sounded by a probe, which could be introduced upwards or forwards its whole length, and about an inch and a half backwards or inwards.

On the 30th, she had some vomiting, during which air was observed to be expelled from the wound with considerable force and some noise, and on the 3d of December she left the Hospital at her own desire. On the 11th, death put an end to her sufferings; and her body was examined at her own house on the 12th, in the presence of Dr Pitcairn, who had formerly attended her, and of myself, by Dr Craigie, lecturer on anatomy and physiology, to whom I am indebted for the following accurate and minute account of the appearances observed.

On removing the integuments of the right side of the chest, and towards the neck, a small superfi-

cial abscess, immediately above the right clavicle, was first laid open. This was found to be situated in the subcutaneous cellular texture behind the posterior margin of the sterno-mastoid muscle, and from it sinuous passages proceeded in various directions. One of these led upwards in a superficial manner behind the sterno-mastoid muscle, and came in direct contact with the superficial plexus of nerves, and some of the twigs of the accessory nerve. Another sinuous passage was at first superficial, but afterwards more deep, and went behind the clavicle downwards to the chest. The extremity of a blunt probe which was introduced into it was found in an insulated cavity formed by the inflammation and adhesion of the pleura. The integuments being dissected from the chest, and the *pectoralis major* exposed, a superficial abscess of the neck was found to penetrate beneath this muscle along its whole breadth, from the superior to the inferior margin, and thence to occupy the space between this and the thoracic origin of the internal oblique, and to proceed backwards towards the lumbar region; but at this region it lay merely beneath the integuments, among the subcutaneous cellular membrane. This extensive abscess had completely detached the middle portion of the *pectoralis major* from its thoracic connexion; and on dividing the anterior attachments of the muscle to the ribs, the abscess was found to penetrate between these bones into the cavity of the pleura, noticed already. Both orders of intercostal muscles



at this part of the chest, which extended from the inferior margin of the second rib to the superior margin of the sixth, were removed by suppuration, and the tendinous *septa* only were all that were left. The breadth of this space, it may likewise be noticed, was, from the most convex part of the ribs to the cartilages, about four or five inches; between the second and third ribs less, between the third and fourth more. The second, third, fourth, fifth and sixth ribs, were at the same part denuded to a corresponding extent of their periosteum; the inferior margin of the second, and the superior margin of the third, were affected with caries, in the form of an irregular uneven depression, following the long direction of the ribs; a similar appearance, of a regular form, but more extensive, was remarked on the fourth and fifth; and the superior margin of the sixth only was carious. Between these ribs, the external abscess communicated of course with the cavity inside the chest. In order to expose this more distinctly, the ribs in question were removed by the saw, and the sternum being also detached, the relative situation of the sound and morbid parts was observed. The cavity which was thus laid open, contained a quantity of purulent matter, was completely circumscribed below by an oblique membranous adhesion between the sixth and seventh, and at some points between the fifth and sixth ribs; but it communicated above by a sinuous passage with the abscess of the neck already described. When the purulent matter was removed, a deep recess was found to

go downwards and inwards towards the *vertebræ*, the bodies of which were felt, but not denuded. Another recess went directly inwards to one or perhaps two of the bronchial tubes; but in consequence of the condensation or *affaissement* of the lungs at this part by the pressure of the purulent matter, it was not so obvious or direct as might be expected. When this portion of lung was removed, it floated in water, but was dark-coloured, and less crepitating than natural. The surface of the cavity was formed by a pseudo-membranous secretion of the pulmonary pleura, unless where the recess above noticed led to the bronchial tubes, which was also much thickened, and had no longer its natural appearance. The costal pleura seemed to be destroyed or removed from those parts of the ribs which were already mentioned as diseased, for nothing but the thickened periosteum could be recognised. The right lung with its pleura, below the adhesion which bounded the cavity, was most remarkably healthy, and quite free from adhesion, unless at its inferior and posterior tip, where an old adhesion connected the pulmonary pleura to that of the diaphragm. The left lung was in like manner sound; and no diseased appearance was observed in the liver, or any other organ.

This case, which, so far as my reading extends, is without a parallel in the annals of medicine, is in several respects remarkable.

It illustrated the progress in the formation of cir-

cumscribed emphysematous tumors, in which the air was confined in cysts formed by adhesive inflammation, and bearing the same relation to common diffuse emphysema that phlegmon does to diffuse cellular inflammation, of which it will be the object of another communication to give some account.

The utility of the stethoscope, in facilitating the diagnosis of pathological states of the lungs, was placed in a very strong point of view. For not only the rushing of the air into, and out of, the tumors, was most distinctly heard during expiration and inspiration, but in no instance did I ever observe the singular phenomenon of pectoriloquism more decidedly and unequivocally than in those external tumors, even in that above the clavicle.

The appearances observed after death confirmed, what is indeed already sufficiently known, the manner in which, by the formation of adhesions, communications between internal organs and the surface of the body take place, without effusion of fluid or the admission of air into the cavities in which they are situated.

By comparing the history of the case with the appearances discovered in the body, various opinions may be formed as to the cause and progress of the disease. It may be supposed, that the whole originated in syphilis, the poison having affected the ends of the ribs, and rendered them carious, while the pus thereby formed had gradually accumulated beneath the pectoral and cervical muscles, and afterwards penetrated and destroyed the *pleura*

*costalis* and *pulmonalis*; or the same effect may be ascribed to the suppuration of the mamma, with which she had been formerly affected.

But it appears to me more probable that the disease, on the admission of the patient, was recent and acute, the previous inflammation of the right side acting at the utmost as a predisposing cause. The first series of symptoms indicated diffuse inflammation of the cellular tissue of the shoulder, axilla, neck and side, terminating partially in suppuration, and coincided exactly with those observed in cases to be afterwards related, in which the pathology of the affection was established by dissection. The subsequent symptoms were chiefly caused by the want of an external outlet to the pus after it was formed, which destroyed the intercostal muscles, periosteum of the ribs, and the costal pleura, and at last found its way into a bronchial tube, so that pus formed externally to the ribs was expectorated, and on the contrary inspired air inflated external cysts. This progress of the disease is also confirmed in some measure by cases to be afterwards related.

I am exceedingly doubtful whether or not the disease was in this instance produced by the lancet-wound of the venesection performed a day or two before admission. At the time I did not suspect it, for the puncture had healed by the first intention; but this has also occurred in other cases, where the connexion between the disease and the puncture was obvious; while, on the other hand, the disease has been observed in patients who have not been

bled, and in whom it was either ascribed to over-exertion, sprain, &c. or could be traced to no probable cause.

This case is also valuable in a practical point of view; for I am strongly impressed with the idea, that the woman could have been saved, or might have had a much better chance of life, if free incisions had been early made in the situation where the ribs afterwards became carious, and if the various tumors had been cut into, as soon as they appeared, even before the formation of fluid pus.

CASES  
OF  
DIFFUSE INFLAMMATION  
OF THE  
CELLULAR TEXTURE;  
WITH THE APPEARANCES ON DISSECTION,  
AND OBSERVATIONS.

By ANDREW DUNCAN *jun.* M. D. Professor of Materia Medica in the University of Edinburgh, President of the Royal College of Physicians, and F. R. S. E.

(*Read 30th July and 13th August 1823.*)

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THE following Essay was commenced with the sole view of communicating to the Society a series of cases of that dreadful affection, which is a constant source of danger to ourselves while engaged in the study of our profession by dissection, and which sometimes occurs in our patients, as the direct consequence of one of our most common prescriptions. But having become convinced, in consequence of much reflection on what I have observed, and of the perusal of the writings of others, not on-

ly that these cases furnish very valuable materials towards the history of a variety of inflammation of extremely common occurrence, frequently severe, and sometimes fatal, but that it has not been duly noticed and appreciated by systematic writers, I have been induced to attempt to condense and reduce into order all the information connected with the subject which I have been able to procure.

One of the causes retarding the progress of our science is the excessive deference paid to opinions advanced by those who have attained great celebrity in the profession. Hence a fashion prevails even in diseases, or rather in the names affixed to diseases. Those, which were once considered as common, cease to be mentioned, while others recently described for the first time, are soon found to be by no means rare. Thus it is probable, that ever since phlebotomy has been performed, and the seats and effects of disease have been investigated by dissecting the dead body, the same kind of untoward accidents have occasionally happened. Their pathology, however, was not understood. At one period they were indiscriminately ascribed to the prick of a nerve, at another, to a wound of a fascia. After the discovery of the lymphatics, inflammation of that order of vessels was supposed to account for all the phenomena; and since Mr John Hunter's first communication on inflammation of the vein \*, many have attributed to that cause alone

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\* Medical and Philosophical Commentaries by a Society in Edinburgh, vol. iii. 8vo. Edin. 1775. See Medical News, p. 430.

all the bad consequences observed. But others have taken a less exclusive view of the subject; and I am of opinion with them, that these cases are of various kinds, but I also think, that the share which a diffuse inflammation of the cellular tissue has in these affections has been still overlooked.

From the perusal of the following cases, every one must be convinced that the disease was essentially an Inflammation, frequently terminating in suppuration; that the Cellular substance was the tissue chiefly, if not solely, affected, and that the extent and progress of the inflammation warrant the propriety of the epithet, Diffuse.

The denomination Diffuse Inflammation of the Cellular Substance, is not new; and will be found in surgical writers from the earliest periods. But they have employed it only accidentally, rather in the description of other affections, than with a view of designating a peculiar genus of disease.

The difference of inflammation, according as it has a tendency to become limited by the effusion of coagulable lymph, or to spread, from this tendency being deficient, is so great that it has been made the basis of classification in the very able treatise of Mr James \*. On the other hand, the effect of

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\* Observations on some of the general principles, and on the particular Nature and Treatment of the different species of Inflammations; being, with additions, the substance of an Essay, to which the Jacksonian Prize for the year 1818 was adjudged by the Royal College of Surgeons. By J. H. James, Surgeon, Exeter, 8vo. London 1821.



the difference of texture of the part inflamed is also so great, that since it was particularly pointed out by Dr C. Smyth, it has perhaps been overrated; and as phlegmon was stated to be the peculiar form of inflammation when seated in the cellular membrane\*, the general adoption of his classification appears to me to have been the main reason why the diffuse inflammation of the same texture has not hitherto been the subject of special consideration. Yet it was constantly forcing itself, as it were, upon the notice of the profession; and in the writings of clinical observers frequent allusions are made to the true nature of various affections, which, I think, are referable to it, although described under different appellations. It is very probable, however, that in attempting to enumerate and describe all the varieties of disease which essentially consist in diffuse inflammation of the cellular texture, I may have gone to the opposite extreme, and included some which are of a different nature. But such an error cannot hurt the progress of science, as it may lead to investigation, and the establishment of the truth.

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\* Medical Communications, vol. ii. 8vo. London 1790. Of the different kinds, or species, of Inflammation, and of the causes to which those differences may be ascribed. By James Carmichael Smyth, M. D. P. 190.

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SECTION I.—CASES.

CASES I. and II.—*From Venesection ; fatal, with Dissections.*

These cases occurred in my own practice in the clinical wards of the Royal Infirmary, and the remarkable appearances discovered by attentive examination after death, first suggested those views of the pathology of the disease, which further experience has corroborated.

CASE I.—Hugh Snell, æt. 60, who had been affected with diabetes for more than a year, was bled in the Royal Infirmary on the 8th of January 1820, and on the 12th first complained of pain in the right arm, which was inflamed at the puncture, and a boil on the elbow of the same side, present since the 6th, was still discharging. A poultice was ordered to be applied; but next day it is reported that he had been totally deprived of sleep by pain, and that the arm was very much inflamed, tense and swoln. He was ordered to take immediately a dose of salts; to continue the application of the poultice; and, as the case was now becoming very serious, the Surgeons of the Hospital were requested to visit him.

14th.—It is reported that he had slept very little from pain. His arm, on inspection, was very much swoln, both above and below the elbow, with great tension and acute pain, which seems to follow the course of the vein, but no red lines, like those ascribed to inflamed absorbents, were visible. The disease in this report was intentionally said *to seem* to follow the course of the vein, because we were not certain of the observation; and, indeed, if we had not formed a previous opinion that his symptoms were owing to inflammation of the vein, the appearances probably would not have suggested its taking that course. I remember he complained at this time chiefly of the back of the wrist, at the proximal end of the metacarpal bone of the thumb, where it was very much swelled and tense. The disease, in fact, consisted in exquisite pain and very great uniform swelling and tension, from the points of the fingers to the highest part affected. He had also severe headache, and his diabetic symptoms continued. By direction of the surgeon twelve leeches were applied to the elbow, and the warm emollient cataplasms were continued; but in the evening these were exchanged for cold saturnine lotions.

15th.—The leeches had procured some relief from pain, and he slept better during the night. The inflammation of the arm now seemed less, but was advancing towards the shoulder. Pulse 104; fever not high; heat 99°; tongue whitish; drink ℥xxvi.; food ℥i. ℥xii.; urine ℥xxiii.; specific gravity 1033;

five dejections ℥ii½. Another set of twelve leeches was ordered to be applied to the shoulder, and the cold saturnine lotions to be continued.

16th.—Slept none, from pain and swelling affecting the arm from the shoulders to the fingers; complains of headache and faintishness. Pulse 120, strong; tongue clean; *ingesta* ℥xxii. ℥xii.; urine ℥xviii.; specific gravity 1029; complains that his throat is closing. His drink, which hitherto had been lime-water and milk, was exchanged for barley water; and, as he had had no stool, an ounce of an acidulated sulphate of magnesia was ordered.

17th.—Twelve leeches were applied over the pectoral muscles, and the arm has been fomented with warm decoction of poppy heads, but he slept none, and the arm is more swelled. A dark coloured bulla has appeared near the elbow, and there is general vesication of the surface, great œdema of the hand, and tension of the pectoral muscles, extending to the epigastrium. The inflammation has not seemed to follow the course of the vein, but is generally diffused. He complains that his throat is quite closed. Respiration free. Pulse 100, small; heat 97°; tongue very dry. No dejection for two days, which distresses him much. *Ingesta* ℥xiv.; urine ℥xiii.; specific gravity 1023. A laxative enema was prescribed with some wine, but he expired tranquilly soon after the visit.

*Dissection.*—Forty-six hours after death.—The orifice made by the lancet was yet open, and readily admitted a probe, but there was no inflammation of

the vein, no thickening of its coats, and no effusion into it of coagulable lymph or pus. The cellular structure of the arm was universally gangrenous, distended with sanious fluid, and the muscular fibres dark-coloured, tender, and literally rotten. The gangrene extended over the pectoral muscles of the affected side, and terminated exactly at the mesial line, forming a striking contrast with the healthy flesh of the opposite side. The lungs collapsed naturally, no tubercles, no adhesions; a small polypus was in the right auricle of the heart, in which, and in the commencement of the aorta, there was a slight blush of inflammation. (The blush, here ascribed to inflammation, was more probably the tinging of the tissue, by the contact of blood after death). Nothing peculiar was observed in the kidneys and renal vessels; mesenteric glands soft and cheesy; stomach greatly distended, its coats thickened; spleen blanched, and smaller than usual; liver healthy, gall-bladder empty; omentum pellucid; and a general want of adeps throughout the body, as is usual in diabetic cases.

CASE II.—Ann Ralston, æt. 23, who had long suffered from a succession of scrofulous abscesses, was admitted into the Hospital on the 8th of May 1821, for a tense and elastic swelling of the abdomen, with a sense of internal fluctuation. On the 12th, she was reported to be better than she had been for two years, but on the 13th her urine suddenly increased in quantity, and from being scanty,

high coloured, and having a strong smell as on admission, it had now little colour, and no urinous smell or taste, and its specific gravity was found to be 1036. On evaporation it yielded a saccharine extract. On the 24th, she was bled from the right arm to ℥xvi., and the serum, as is usual in diabetic cases, was milky.

25th,—Had a good night, her urine ℔xiii.; fluid food ℔viii., solid ℥xxvii.; pulse 92, skin natural, little thirst, keen appetite. She was directed to take half an ounce of the infusion of digitalis three times a-day. 26th,—Was seized in the night with pain in the bend of the right arm, where she had been bled, and with sickness and vomiting, which continued till morning preventing sleep. There is a slight blush and some diffused swelling, with great tenderness around the incision, and these symptoms are increasing; pulse 120, very full; appetite diminished; thirst great; urine ℔xv.; one dejection weighing ℥viii.; solid food ℥xxi.; fluids ℔x. Ten leeches were ordered to be applied to the arm, followed by cataplasms to encourage the bleeding; and in the evening, the arm was directed to be kept cold with solution of acetate of lead; a dose of sulphate of magnesia was also prescribed.

7 *p. m.*—The leech bites are still bleeding freely, salts have not yet operated, pain of arm a little increased, but no increase of swelling. Constant sickness, and frequent retching, but only a little phlegm was brought up. Pulse 130, full; tongue moist.

27th,—Salts operated five times; had a bad night from pain in the bend of the arm, which is a little more swelled, redness not great, nor can any affection of the veins or lymphatics be perceived. Wound from the lancet seems to be quite healed; finds some relief from the cold lotion, but still retches frequently; fluids taken ℥iij. ; no solids; urine ℥iv. ; dejections ℥ii. ; pulse 112., full and harder; heat 101°; tongue foul, no appetite, thirst moderate. Lotions to be continued, and to be bled from the other arm, if she can bear it, to ℥xxx.

8 *p. m.*—Became very faint after ℥xxv. of blood were taken. Blood very buffy in one vessel, less so in another. No abatement of pain; nausea continues, without retching. Pulse 122, small and soft.

28th,—Had but two hours sleep, in consequence of pain of the arm, which now extends to the shoulder. Arm more swelled, a little ichor is discharged from the lancet-wound, and she complains of numbness around the orifice. Still retches frequently; pulse 118.; heat 101°; skin somewhat moist, tongue dry and white. No appetite, thirst moderate, three dejections, urine scanty and turbid, but without urinous smell. To take 1 gr. opium immediately. To take ℥vi. of port wine daily, and the cold lotion to be continued.

8 *p. m.*—Felt a little easier, and slept after the pill. But the pain is now as bad as ever, and the arm more swelled; pulse 125, small; heat 98°,

two dejections. The pill to be repeated, and cold lotions continued.

29th,—Pill and wine have been taken this morning; had a bad night from continual pain, arm more swollen, with evident redness towards the wrist; and the swelling extends without redness over the upper part of the breast to the sternum and nipple, with great fulness and tenderness. A large vesication on the inner part of the arm, surrounded by a livid margin, arose in the night and broke; skin beneath white, and not sensible to the prick of a needle. Small vesications have also appeared on the arm with partial discoloration; but the lancet-wound is not particularly affected, nor does the disease follow the course of the vein. Fluids taken ℥i. ʒvi., urine ℥i. with dense yellow sediment, and to the taste saline, not saccharine. To take two grains of opium immediately, to have ʒviii. of wine daily, and the arm to be dressed with hot dressings and poultices.

8 *p. m.*—Pill and wine taken, and hot dressings applied; has since had less pain and dozes much, but there is no alteration in the appearance of the limb. Tongue white, with bad taste; one scanty dejection; urine scanty.

30th,—Treatment continued through the night, which was bad, but she dozed occasionally; pain of arm not so severe, but complains of soreness of breast. No fresh blisters; those observed yesterday have burst, and the skin beneath is insensible. Arm more swelled towards the axilla, elbow bright



red, but not very painful; lancet-wound of the left arm has healed; thirsty; pulse 120, rather full but not hard; heat  $102\frac{1}{2}^{\circ}$ , tongue foul on the back part; great thirst, drink ℥ii. ℥ix.; urine ℥i. Twenty leeches were ordered to be applied to the shoulder and breast.

8 p. m.—Leeches did not bleed well. Arm as in the morning, but the right breast and axilla much more swelled. Pain very great, increased by respiration rendering her restless during the whole day, countenance very anxious, frequent hiccup; pulse 122, sharp and rather hard; heat  $101^{\circ}$ ; tongue rather foul and moist. One scanty dejection; urine ℥i. To take two grains of opium every second hour, for three times.

31st,—Took ℥viii. of wine, and three grains of opium, and had some short sleeps, and suffered less from pain. Awoke at eight this morning with moaning, which still continues. Pus is discharged from the lancet-wound, and the blistered parts are livid. Arm not more swoln, but the chest and side are soft, with a sense of fluctuation; the veins around the mamma dark-blue; respiration slow and laborious, with cold sweat on the forehead. countenance cadaverous; extremities cold; pulse 120, very small, weak and intermitting; respire only twice in the minute; has had one small dark dejection, and made ℥i. dark cloudy urine. She sunk in the course of the day.

*Dissection.*—On the 2d of June, at 8 a. m.—Externally upon the sternum and under both

clavicles, particularly the right, there was much livid colour, and many small vesications. Upon the right side, immediately under the ribs, very extensive vesications had arisen, from which the water had been evacuated, and the cuticle partly removed. The same livid colour and vesications appeared upon the right shoulder, running down the back. Upon removing the integuments from the lancet-wound of the right arm upwards, a considerable quantity of serum was discharged, and some purulent matter was found diffused in the cellular membrane, which was not destitute of fat. The integuments being further removed, the muscles of the arm and chest came into view, which discovered the chief seat of the disease. The *biceps* and *pectoralis major* muscles were nearly black, and in a state approaching to gangrene; the texture in some places was so far destroyed, that it could be broken down by the finger; this was particularly remarkable in the *pectoralis major*. The smaller pectoral muscle was also slightly affected upon its surface.

A probe was then introduced into the vein, which was laid open as far as the axilla. The vein was found to be perfectly healthy, and appeared not to have participated in the slightest degree in the surrounding disease. Its internal surface was white, and its tunics sound and healthy.

In the thorax nothing morbid was observed.

The abdominal viscera also were healthy, and, with the exception of the kidneys, which were

thought by some to be rather larger than natural, no deviation from healthy structure was observable.

In the heart, a considerable polypus was found in the right side, both in the auricle and ventricle, as well as in the pulmonary artery. In other respects it was quite natural.

CASE III.—*From Venesection, complicated with Inflammation of the Vein; fatal, with Dissection.*

14th April 1821.—Michael Dogherty, æt. 31, labourer, was admitted into Queensberry House Fever-Hospital, under the care of Dr Home and myself, having had in the morning a severe attack of rigors, succeeded by flushing, pain of head, and the usual symptoms of continued fever. Next day, he was bled to  $\bar{z}$ xx. in the median cephalic vein. On the 3d day after the bleeding, he had passed a very restless night from pain of arm; the wound had suppurated, and the edges of it were everted with slight surrounding inflammation. On the 5th day, the pain was much increased, and extended from the shoulder to the fingers. There was much inflammation and hardness for three inches above and below the wound, from which pus could be pressed out, mixed with blood; pulse 104, feeble; heat  $103\frac{1}{2}$ ; skin hot and dry, countenance anxious and oppressed. 7th, Inflammation has extended along the arm towards the wrist, as also upwards as high as the middle of the biceps, following the course of

the vein; less discharge from wound; constitutional symptoms continue. 11th day, Inflammation occupied the whole arm, which was much increased in size and œdematous, with great pain on being moved or touched; had a severe rigor last night with delirium; complains of great uneasiness extending across the chest; pulse 112, weak; stools dark, back of hand and wrist swollen and inflamed. 13th, Delirium continues with constant anxiety and sighing, pain of chest continues, feet and legs are œdematous, articulates with difficulty. 17th day, Delirium and œdema continue, with diarrhœa, back a little discoloured; pulse 124, feeble; considerable subsultus, countenance more anxious, and breathing is hurried. 20th, Discharge from arm continues, but swelling is nearly gone, delirium and subsultus continue, fœces passed involuntarily. 24th, There is a large sphacelation over the sacrum, other symptoms much the same, wound of arm healing, and no discharge from it. 27th, Slough has separated, and is not extending; wrist of opposite arm is much swollen\*, and a distinct fluctuation is felt in it; no discoloration of the skin. 29th, Appears much reduced and insensible; breathing laborious and hurried, respirations 48 in the minute; pulse

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\* He had also exquisite pain in the left knee, which added not a little to his irritability, and Dr Dumbreck, then Superintendent, by whom the history was taken, and the dissection performed, mentions in his private notes, that in another case which proved fatal, he has noticed this metastasis affecting the foot, and giving much uneasiness.

136, moderate; tongue and teeth covered with sordes. 30th, Sunk gradually, and died at 4 P. M. \*.

*Dissection.*—The body was much emaciated. On removing the integuments from the right arm, the subjacent cellular tissue was found considerably altered in structure, being converted into a firm ligamentous-like substance, and with difficulty separated from the surrounding parts. The *mediana longa*, from the back of the thumb to its termination in the median cephalic and basilic, presented the appearance of a nerve, being somewhat of a fibrous structure, but resembled an artery when cut transversely, the cut extremities presenting circular orifices, and not collapsing, as in healthy veins. When slit open, its coats were greatly thickened, and its surface lined with a thick layer of coagulable lymph. About the middle of the fore-arm, a small abscess formed in the vein, but was prevented from extending by the coagulable lymph. Above two inches above the bend of the arm, the cephalic and basilic veins were filled with pus, and their coats were uncommonly thin and easily ruptured. This appearance extended to the axillary vein, and terminated abruptly before

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\* Inflammation of the vein commonly proves fatal from the 5th to the 10th or 12th day. The case here given is an exception certainly; but they are seldom so protracted, and this may probably have arisen from the cellular membrane along the course of the vein having been the primary affection, which is rendered more probable, from the thickening of the cellular membrane observed on dissection.—*Dr Dumbreck.*

the vein crossed the first rib. The vein remained quite pervious, though its cavity was much diminished, neither did it contain a particle of blood, nor could its valves be observed. Between the first and second ribs, near to their sternal extremities, an opening was discovered leading into a sac, formed by an adventitious membrane of coagulable lymph, filled with purulent matter, and pushing inwards the *pleura costalis*. The sac contained four or five ounces of pure pus. At the left wrist there was a similar collection of matter, containing about six ounces of pus. The lungs were perfectly healthy in their structure, but several old adhesions existed between the pleuras in both sides. The heart was natural and healthy; but on the left side there was a deposition of coagulable lymph on its external surface, and the inner coat of the aorta to its arch had a deep red appearance. The other cavities were examined, but nothing of any importance was found.

CASE IV.—*From Venesection; severe, but not fatal.*

Elizabeth Harper, æt. 34, was admitted by me into the clinical ward, on the 19th of November 1822, on account of a hepatic affection. She had been bled from the arm, on the evening before admission, with great relief to her symptoms; but at our visit on the 21st, we found that she had complained during the night of pain in her head and back, with some

pain in her right shoulder. The skin for some distance around the orifice was of a dull red, and there exuded from it on pressure, a small quantity of sanious fluid, sometimes a little purulent and bloody. The arm at this spot, and for some distance above and below it was very sensible on pressure, but there was no redness or feeling of a cord in the course of any of the vessels, nor any tenderness or swelling in the axilla.

The incessant application of cloths soaked in very cold water was ordered, and in the evening we had the satisfaction to find, that the redness was less extensive and less vivid, and to learn, that the cold application continued to be eminently beneficial.

On the 22d, a little fluid could still be pressed from the lancet-wound, and the redness was upon the whole less considerable, but its degree depended much upon the regularity with which the cold application was renewed. The pain extended to a short distance both above and below the inflamed part, but no swelling could be observed. Twelve leeches were ordered to be applied above and below the redness.

On the 23d, there was evident hardness and fullness, both above the puncture, along the outer edge of the biceps, and on the fore-arm. She had some startings in the elbow, but no tenderness in the axilla, shoulder, or breast; pulse only 78, and the bowels natural. Warm cataplasms were now ordered, but it appeared at the evening visit, that

they were rather hurtful than beneficial. The arm had become more painful, redder and more swollen, and the tenderness extended both down to the fingers which were swollen, and up the arm to the axilla; she also complained of headache; her spirits were depressed, and her pulse had risen to 104. The removal of poultices, and the exposure of the arm to free air, quickly gave some relief, but the application of twenty-five leeches, followed by cold evaporating lotion, produced a more decided effect.

On the 24th, there was more appearance of an abscess forming in the fore-arm.

On the 25th, the patient stated, that the cold application no longer agreed, and that warmth was more grateful to her sensations. The phlegmon was advancing, and a diffused fulness, without redness, or increased sensibility, occupied the back of the fore-arm. Leeches followed by cataplasms were freely applied on the 25th, 26th and 27th, with much benefit. The phlegmon on the fore-arm declined, but another appeared immediately above the lancet-wound, which burst and discharged its contents repeatedly by that orifice. After this, the disease gradually declined, and the last symptom to be removed, was rigidity of the biceps muscle. But it deserves to be remarked, that the application of camphorated oil, with the view of removing it, excited a considerable degree of cutaneous inflammation, with great swelling and increased sensibility.



CASE V.—*From Venesection ; severe, but not fatal.*

Jane Robertson, æt. 19, was admitted into Queensberry Hospital, 5th April 1821, with fever and affections of the stomach. Was bled on the 17th May ; complained of her arm on the 24th, when it was found to be much swollen and painful on pressure. Next day, the arm was still swollen and painful ; there was a small discharge of pus, and the pain shot down to her fingers. Her pulse had risen suddenly from 72 to 130, and she had the usual symptoms of typhoid fever.

On the 26th, the swelling of the arm was diminished, the wound looking well, and discharging a small quantity of pus ; but she complained of pain in the axilla and wrist, and the latter was slightly swollen. She received great relief from leeches and cold applications, but the affections continued for a long time, varying in intensity. On the 29th, the pain was very severe from the axilla to the fingers ; but especially from the elbow to the axilla, the slightest pressure could not be borne. Leeches again gave some relief, but the pain continued, occasionally extending down her back (30th), and in the region of the pectoral muscles, which was swollen and soft. (June 6th.)

The discharge from the lancet-wound ceased on June 2d, but the arm felt remarkably hard, and was very painful on pressure ; on the 4th she could not bend the elbow-joint, and the arm a-

bove the wound was rather more swollen and painful. On the 5th the swelling was more painful and tender. On the 7th the pectoral muscle is reported tender and more painful. On the 8th the pain stretched to the sternum, and the pectoral muscle was red, with a throbbing sensation on the 9th. Fluctuation was perceived on the 12th. On the 13th fluctuation in the centre of the biceps.

An incision was made on the 14th into the tumid part in the axilla, which discharged a considerable quantity of pus ; and the fluctuation in the region of the biceps was opened on the 15th, and 6 oz. of pus let out with great relief. These orifices continued to discharge for a considerable time, but on the 17th she complained of pain below the elbow-joint, which seems to have been relieved by an increased discharge of pus on the 23d. July 2d, pain again below the elbow, and the orifices had both ceased to discharge. 16th, Pain in the upper part of her arm ; and on the 17th she stated her conviction that the pain was in the bone. After this it continued with increasing severity, although no external symptom appeared. On the 30th a free incision was made without relief, and it healed by the first intention. On the 5th August it was repeated in the exterior part of the upper arm, through the fascia and a probe freely introduced round the wound, but no purulent matter was found, and no relief obtained ; and after a great variety of other affections, she was dismissed, on 17th October, with her arm rigid, and the constant pain in no degree relieved.

After leaving the Hospital, however, she gradually recovered. The pain entirely ceased, and she acquired the use of her arm, except that she could not extend it completely. Of this I assured myself by personal examination lately, when she was a patient in the clinical ward for another affection.

CASE VI.—*From Venesection; not fatal.*—Communicated by Dr ROBERT JOHNSTON, Kirkaldy.

——— Stewart, æt. 60, of a full and plethoric habit, was bled by one of my father's pupils for a slight pulmonic affection. Next day the parts surrounding became very tense and painful. On the following day I found that the inflammation had extended up the arm as far as the axilla, and over the pectoral muscle of the same side. I directed a warm poultice to be applied, which gave her some relief; and during the night she was attacked with rigors and high febrile symptoms, accompanied with coma. She took six grains of Calomel and twelve of Powder of Rhubarb, to be followed up by Infusion of Senna with Sulphate of Magnesia. Two hours afterwards, finding the symptoms nothing abated, eighteen leeches were applied, which bled well, and warm fomentations were used for half an hour; the medicines produced three copious dark coloured stools. Next evening she had a draught of thirty drops of Tincture of Opium, and a drachm of Antimonial Wine. I found her next morning con-

siderably better. She had rested well; the pulse was diminished in frequency, and much softer; no thirst, with some appetite. She took some water-gruel for breakfast. I directed a saturnine lotion to be constantly used, and light diet. On the third day an abscess formed at the insertion of the deltoid muscle, which my father thought it prudent to open, but upon pressure it discharged quite freely at the opening made by the lancet.

From this time she gradually recovered, and is now quite well.

CASE VII.—*Fatal; complicated with Veinous Inflammation, from ligature of a Vein.*—Communicated by Dr DUMBRECK.

Mary Macgregor, æt. 58, who had had the right mamma successfully removed for scirrhus in the Hospital ten years before, was again admitted, 1st September 1821, for a scirrhus tumour in the right axilla. It was removed on the 8th, and was found to burrow very deep, and a vein was tied in the operation.

9th, Had an attack of shivering through the night, followed by fever this morning. Complains much of pain of breast and of the arm. Vomits every thing liquid.

10th, Sickness and tendency to vomit continue, with pain at the ensiform cartilage. No stool. Leeches were applied to the epigastrium.

11th, Vomiting abated, but sickness continues.

Tongue foul and dry, Pulse 108, soft. No stool since the 8th. Wound dressed, edges in contact, but discharge thin and unhealthy.

12, Bowels opened by medicine. Tongue very dry and foul. Complains much of numbness of arm.

13th, Pulse 120. Tongue still dry in the middle. Sickness, but no retching. Countenance anxious and oppressed.

15th, Considerable change in countenance since yesterday, which is anxious and oppressed. Wound looks unhealthy, and discharges thin serous matter. Pulse 120. Tongue dry, and foul.

16th, Died this morning.

*Dissection.*—The parietes of the cavity left by the tumor were found in a sloughing state. The neighbouring muscles, particularly the *pectorales*, *teres major*, and *latissimus dorsi*, were quite black, and yielded to the slightest violence. In their interstices there was much effusion of a yellow substance, resembling coagulable lymph. A ligature was found round the axillary vein, about half an inch below the entrance of the cephalic, and another upon the subclavian, a little above the entrance of the cephalic. A clot, about  $1\frac{1}{2}$  inch long, was formed in the axillary vein, below the ligature, and a firm yellow fibrous clot, not quite so long, in the subclavian, above the ligature. The internal coat of the vein below the ligature seemed inflamed. The coats of the vein, from the upper ligature to the entrance of the external jugular, were much thickened, so as to re-

semble the coats of an artery. The portion of vein between the ligatures was much shrunk on the side next the axilla, and a small puncture was distinctly visible between them. The coats of the ascending cava, right auricle and ventricle, were very dark coloured.

CASES VIII. and IX.—*From Dissection ; the one fatal, the other severe.*

Of the two following interesting cases, I regret much that I kept no notes at the time, but the chief circumstances were strongly impressed on my memory, when I wrote out their history, which was revised by Mr Blyth and Mr Lizars.

On the evening of Saturday, 30th December 1821, I was carried by Dr William Campbell to visit two professional gentlemen, Mr Blyth and Mr Young, who had been taken severely ill shortly after having been engaged in examining a body. The disease in both was so similar for some days, that the same description will serve.

On Thursday the 28th of December, Mr Blyth was called to examine the body of a woman, and was accompanied by Messrs M<sup>c</sup>Donnell and Young, students of medicine. The body presented no uncommon appearance externally, and emitted little or no putrid smell, but was extremely emaciated. The thorax was found to be nearly filled with serous fluid, slightly tinged with blood, and without

any admixture of purulent matter. To form some idea of the quantity, Mr B. removed it with a cup, and consequently his hand came repeatedly into contact with it; and before closing up the thorax, Mr Young, who had hitherto been only a spectator, put his hand into the cavity and compressed the lungs. In a few hours after the dissection, Mr Blyth felt a slight smarting in the index-finger of the right hand; and, on examining it, observed that a small portion of the cuticle, not larger than a pin's head, had been abraded, and the spot appeared a little inflamed. He applied a bit of adhesive plaster, and thought no more of it that day. Having gone out next morning, he felt uncommonly chilly, which he then attributed to increased coldness of the weather, but was surprised, on mentioning the circumstance to a friend, at being told that the air was unusually warm and mild for the season. During this day Mr Blyth felt uncommonly languid and depressed, and towards evening became so ill as to be under the necessity of going to bed. About this time Mr McDonnell called, and suspecting the real cause of his illness, went immediately for Dr W. Campbell, who bled him by opening two veins of the left arm, but very little blood could be abstracted. In the afternoon of Saturday, Mr Blyth was suddenly seized with a lancinating pain in the glands of the right axilla; which was quite excruciating.

At our visit on Saturday evening, we found both our patients suffering under those symptoms which

commonly characterise typhus fever ; but our attention was chiefly directed to the local affections connected with the supposed cause. In each there was a slight abrasion on one finger, but when accurately examined, there was no inflammation or any appearance indicating a poisoned wound. There was not the slightest trace of an inflamed absorbent or vein from the finger to the axilla. Every part of the arm could be freely pressed, and every joint moved in all directions, without exciting the smallest pain, nor was there any discoloration whatever. In the axilla of both gentlemen was the first appearance of a morbid state. In both the glands were enlarged, and there was exceedingly painful general diffused swelling, with considerable redness, from the axilla up along the neck, and for several inches downwards along the side. The swollen parts did not pit on pressure, but gave an obscure sense of fluctuation, which was well characterised by Mr Lizars by the term *boggy*. At my request Mr Lizars plunged a lancet into the swelling on Mr B.'s side, about an inch and a half below the axilla, but nothing at that time was discharged from the wound but a little blood.

As no relief had been obtained, in Mr Blyth's case, from the puncture, as many leeches as could be fixed were now applied to the parts affected, and the bleeding was promoted by warm cataplasms renewed every two hours. A blister was at the same time applied to the thorax, on account of some affection of the breathing, but it did not rise well.



Mr Blyth now became very restless, though without delirium, which state continued several days and nights. Antimonial anodyne draughts were administered, with very little advantage, as they failed to induce sleep. Mr Blyth also suffered greatly from thirst, which no drink could quench, though with the intention of allaying it he swallowed great quantities of water acidulated with sulphuric acid.

In this state he continued about eight days, the diffuse swelling gradually extending down the side, with increased redness of the skin. The pain and inflammation then gradually diminished, the cuticle peeled off, and we were congratulating him on his fortunate escape, when one morning Mr Blyth was much surprised by the appearance of a quantity of pus which had flowed from the puncture made in his side by Mr Lizars at the beginning of his illness. An abscess was now found extending downwards as far as the *os ilium*, and nearly to the pubes. To allow a free exit to the pus, several punctures were made at the most depending points, and to preserve a free communication between them, a probe was occasionally introduced at the upper orifice, and brought out at those below. For many days there continued a very copious discharge of purulent matter, at last accompanied by considerable flakes of a substance not unlike a skein of thread, which we considered to be disorganised cellular membrane. The treatment consisted in applying compresses with bandages to the margins of the abscess, and keeping the orifices open as long as there was pus to be discharged.

Under this treatment, Mr Blyth was recovering rapidly, when he became affected with an aphthous sore mouth. The whole of the fauces, as far as they could be seen, was encrusted with a thick layer of coagulated albumen, which was no sooner detached than it was renewed. It was only with the greatest pain that he could swallow any thing, solid or fluid, and the secretion of viscid saliva was so excessive, that his head had to be raised every five minutes to allow it to escape, otherwise he was in danger of being suffocated. Gargles of every kind were tried without effect, and a blister applied to the throat was the first thing that afforded him relief. At this time Mr Blyth was also much distressed by an obstinate and alarming hiccup, which was at last removed by sipping milk and water, by the advice of Mr Lizars, who had found this practice prevent hiccup even in the last stages of yellow fever. When convalescent, Mr Blyth was allowed a nutritive diet, with a liberal use of wine. His recovery at last was complete, so that there is even no adhesion of the skin to the muscles of any part of the side.

Though strikingly similar in its commencement, and progress for some days, the disease proved fatal to Mr Young. On the same day that Mr Blyth's attention was attracted to the sore on his finger, Mr Young was observed to have his finger bound up, and, on inquiry if he had cut it, he stated that a few days before, it had been slightly scratched with a pin, and finding it a little painful, he had just

then had it dressed. For some time before this, he had been under treatment for an affection of the chest; and on the evening of the dissection he had fallen down stairs, not without suspicion of intoxication. In general the symptoms and treatment were so similar to those in Mr Blyth's case, that it is needless to repeat their description. On the whole, the case seemed rather milder than that of Mr Blyth, and great hopes were entertained of Mr Young's recovery, when he was suddenly seized, in the morning of Thursday, 4th January 1822, with all the symptoms of pleuritis in the highest degree, for which a vein was opened without affording him relief. In the evening he became outrageously delirious, and died early next morning. The body was opened next day, in the presence of Dr Campbell and myself, by Mr Lizars, to whom I am indebted for the following description of the appearances observed.

*Notes of the Examination of the Body of Mr Young.*

The skin of the right side of the trunk, from the axilla to the crest of the *os ilium*, appeared as if a blister had been applied immediately before death, and the epidermis was raised and wrinkled, with a quantity of serum effused under it. The *cutis vera* was motley in several places, and appeared about to sphacelate, and the skin of the inside of the arm of the same side, from the axilla to the elbow, had also a motley appearance, but less marked.

An incision was first made from the clavicle to the crest of the *os ilium*, and another crossing it to

the axilla, when the subcutaneous cellular substance appeared in some places distended with serum, especially about the loins, while in others it was turgid with purulent matter, which was most conspicuous over the *pectoralis major*. On prosecuting the dissection, the whole cellular substance of the side, from the axilla down to the os ilium, and from the spine to the sternum, was more or less purulent; the cellular sheaths of the *latissimus dorsi*, *serratus major anticus*, *pectoralis major* and *minor* muscles, were all purulent; and even the prolongations of the cellular membrane, which divide the muscles into their different fasciculi, were equally purulent. Between the two pectoral muscles, and beneath the *minor*, the infiltration of the cellular substance with purulent matter was very conspicuous. The carneous fibres of these muscles had in general lost their cohesion, and were of a dirty-yellow colour. The intercostal muscles were pretty sound, but the external surface of the pleura beneath them was highly inflamed, and the vessels bold and distinct, and conspicuously ramified.

In the axilla there were numerous small collections of purulent matter, as if it had been secreted into the cellular tissue. The lymphatic glands were enlarged and inflamed, but had not suppurated. The nerves possessed their natural colour, so did the axillary artery, and even its branches, with the exception of those immediately supplying the axilla. The vein in some parts had a dirty-red appearance, and the small branches coming from the

axilla were immersed in purulent matter, and had lost their tenacity.

The dissection was next carried down the arm: the brachial vein, as well as the median-basilic, was slightly red in several places, and a twig of the internal cutaneous nerve presented an inflamed appearance; which, however, ceased at the bend of the arm. The cellular substance of the arm was every where healthy, and there was not the slightest vestige of disease in the fore-arm, nor could any connection be traced between the abrasion on the finger and the morbid parts.

The thorax was now examined: the pleura of the right side, which has been already mentioned as inflamed on its outer surface, was much more so internally. Here its colour was deeper, and the inflammation was in patches, extending over the whole surface of the cavity to the mediastinum and pericardium. The surface of the right lung had a white appearance, from coagulable lymph effused upon its *pleura pulmonalis*, which was considerably thickened, but the substance of the lung itself was healthy. In the cavity of this side of the chest, more than three pints of bloody serum, with flakes of coagulable lymph floating in it, were found. The pleura and lung of the left side were perfectly healthy, but some bloody serum was found in the cavity, though not nearly so much as on the right side. The *vena cava descendens*, and the right auricle of the heart, appeared inflamed, but the other cavities were healthy, and all of them filled with blood, part of

which had an appearance of fibrine. The walls of the ventricles, when cut across, were darker than natural.

CASE X.—*From Dissection; severe, not Fatal.*—Communicated by Mr Whitelaw.

John Whitelaw, middle aged, of full habit, in good health, free from any scrofulous taint, but of a nervous, irritable temperament, was engaged, on the 10th of November 1821, in Mr Lizars's Rooms, Edinburgh, dissecting a body which had been long kept, and was very much decayed. About three o'clock in the afternoon of the same day, when examining the diaphragm, he made a small incision, not exceeding one-sixth of an inch in length, close by the nail of the forefinger of his left hand. It was merely sufficient to bring the blood. He wiped it clean, sucked it well, and having, as he thought, removed all ground of apprehension, went on again with the dissection. He observed nothing peculiar, either in the finger, or in his general feelings, till about nine o'clock in the evening, when, after drinking a single glass of whisky-toddy, he felt a warm glow diffuse itself over his body, and immediately the finger began to feel uneasy. The sensation at first was merely that of increased heat. Soon after it became somewhat painful. But the pain was very slight, and confined to the single point where the wound was received. He now began to be apprehensive of the consequences. He again washed and sucked the finger well, wrapped

it up with a rag spread with simple ointment, took a dose of purgative pills, and went to bed. During the night, the sensation of heat and pain continued to increase,—pulse considerably accelerated, and he slept little. These two last symptoms the patient judged to be a good deal owing to the state of his mind, having become very apprehensive.

11th Nov.—Pain of finger still increasing, with a sense of throbbing. On getting out of bed felt chilly, pulse 90, small and sharp. No appetite for breakfast. Took an ounce of sulphate of magnesia, drunk a few cups of tea, and walked out. Felt chilly, and exceedingly uncomfortable. Spirits much depressed. Consulted Mr Allan, who directed him to make a strong solution of the acetate of lead and opium in boiling water, and to dip the affected finger into it a number of times, retaining it as long each time as he could bear it. As the solution cooled, the whole hand was to be immersed into it, and kept half an hour. A poultice was also ordered to be made of the same materials, and applied as hot as the hand could bear it. Both the dipping process and poultice to be renewed every two hours. This prescription was carefully attended to. Towards evening, a slight degree of inflammation observed round the edges of the wound, pain sharp and throbbing. Chillness, and other febrile symptoms much increased. Bowels freely evacuated by the cathartic medicines. Pediluvium, and went to bed. Fever increased much during the night. No sleep; slight delirium.

12th.—A small elevated dark-coloured tumor perceived on the finger, surrounding the wound. The hand swelled slightly as far as the wrist. Muscles of the forefinger and thumb stiff, and painful on motion, or when pressed. Pain beginning to be felt stretching up the inside of the arm to the axilla and shoulder. The fever high, pulse rapid and small, with headache, vertigo, nausea, but little vomiting. Patient unable to sit up. The same applications continued. Patient wished to be bled, but this was not thought advisable.

All the symptoms aggravated towards evening. Some delirium during the night. Pain in the axilla and shoulder now growing severe; the wrist and elbow joints little affected.

13th.—Tumor on the finger larger, and extending up towards the first joint, attended with much burning pain. Red streaks now perceived on the inside of the arm near the axilla, but little or no swelling. The same applications continued to the hand. Barley-water and gruel the only food taken. Bowels kept open by saline medicines. Patient could not lie but on his back, or move at all without much pain; felt also very weak. The following night passed in much distress. The pain now stretching along the pectoral muscles and those of the scapula. Pulse from 110 to 120, with delirium, but patient correct in his answers when spoken to.

14th.—Patient again desired to be bled, but it was thought that it would weaken him too much.



Towards evening all the symptoms very much aggravated. The pain extending along the pectoral muscles on the fore part to the sternum, and behind to the spine, down the back, in the direction of the *latissimus dorsi*, and up the neck to the ear, and hind part of the head. The arm and shoulder a little swelled, and somewhat red, but neither the redness nor swelling in any proportion to the pain, the principal seat of which was still in the shoulder joint and axilla. The sensation much resembled that burning pain which is experienced in acute rheumatism. The early part of this night spent in great distress, with considerable delirium at times. Pulse about 130; much headache; burning heat all over the body. After midnight, patient's strength became much exhausted, when a gentle diaphoresis began to break out, and he gradually fell into a more easy and quiet state, approaching to sleep. The diaphoresis increasing, terminated in a most profuse dark-coloured clammy sweat, of a smell so exceedingly foetid and disagreeable, that it could neither be borne by the patient himself, nor by his attendants. It was in such abundance, as not only to wet his body-clothes, but also the bed-clothes, and stained them of a dark colour, so that they could with difficulty be washed white again. When the patient awoke out of this state of slumber, in which he had continued during the perspiration, he felt great relief of all the symptoms. The fever was much moderated, and the pain of shoulder much relieved. But upon inspection,

the arm and shoulder were observed of a dark ferruginous colour, and his whole body emitting such an intolerable stench, with great prostration of strength, and small pulse, as induced not only the patient, but also some of his medical friends, to believe that gangrene was commenced. This occasioned much alarm and agitation of mind.

15th,—One of his medical friends now called in Dr Sanders. He assured the patient (who had still a little delirium, and much despondency) that there was nothing like gangrene in the case, and that the dark-coloured foetid sweat was the most fortunate thing that could have happened. The remainder of this day passed in comparative ease, although exceedingly weak and exhausted. In the evening had an exacerbation of fever with some delirium, and much phantasma. Whole system in a strange state of nervous irritation. Spirits preternaturally elevated. Had no sleep during the following night, but lay quiet. Pain of shoulder, though considerable, much less severe.

16th.—Patient felt himself exceedingly weak. Beef-tea and gruel taken. Pain of shoulder rather increasing. Warm fomentations ordered. Swelling of the finger and hand stationary, but pain not so severe. About four o'clock in the afternoon, pulse became rapid and weak. Soon after this fainting fits succeeded, which continued at intervals during the whole of the ensuing night. Profuse perspiration, but without either foetor or dark colour. Wine and beef-tea drunk freely.

17th.—Patient so weak that he can with difficulty be raised up in his bed. Pain of shoulder and hand same as yesterday. Exacerbation of fever in the evening; no sleep during night.

18th.—Pain of shoulder same as it had been for two days past. Felt rather more strength to-day. Fever and delirium increased towards evening as usual, and continued till morning. A little white milky-looking matter oozed from under the nail of the finger where the wound was received. After this the finger ceased to trouble him, except that it was stiff and swollen, and the muscles of the hand exceedingly painful when moved or pressed.

From the 18th to the 25th November the disease appeared stationary, or rather on the decline. The pain in the shoulder, though still very considerable, was much mitigated from what it had formerly been, and the fever reduced in violence, though still attended with pretty smart evening exacerbations, which continued during the greater part of the night. The warm fomentations were continued to the shoulder.

On the 26th November, patient felt so well as to get out of bed, and sit up an hour. On returning to bed was seized with a violent rigor, which continued nearly an hour, although he was covered with a load of warm clothes, and bottles of warm water applied to his feet. This was succeeded by high fever, which lasted during the night. Had a slight remission in the forenoon of the 27th, with a

return of fever again in the evening, and an increase of pain in the arm and shoulder, stretching along the pectoral muscles, and those of the scapula, as at first. Eight leeches applied with considerable relief; but in two days afterwards the pain returned with great severity. The fever now assumed a more regular remittent form, the exacerbations coming on about three o'clock in the afternoon, continued severe from six to nine in the evening, and then gradually declined to midnight. From this time until the usual period of the accession, fever more moderate, but without any proper intermission. Pulse, during the remission, from 90 to 100; during the exacerbation, from 100 to 110. Skin hot and dry. Bowels kept open by medicine. In time of the remission, infusion of cinchona exhibited, and an anodyne draught about midnight, which, however, though it gave some ease, procured no sleep. Hopes still entertained that the inflammation and pain of shoulder would terminate by resolution.

3d Dec.—A large blister applied, which rose well, but was followed by violent stranguary, and no relief to the pain. After the healing of the blister, fomentations and warm poultices again had recourse to. Fever still on the increase, and pursuing the same course. The patient growing very weak, small quantities of wine given, but this appeared to increase all the febrile symptoms. The shoulder now swelled considerably, and a little red. Pain very severe.

7th.—The humerus, shoulder, pectoral muscles, and those of the scapula, considerably swelled and red. Pain very severe. Fever had now little or no remission. Slight rigor in the evening. Night passed in great pain, and high fever, but no delirium.

8th.—A small soft tumour observed in the axilla. Febrile affection the same as yesterday. Rigors again in the evening. Pulse 112, small.

9th.—The tumour increasing rapidly in size; in other respects the same; rigors.

10th.—A pretty large bag now filled up the whole cavity of the axilla. It felt quite soft to the touch, and evidently contained a fluid. To-day it was opened by Dr Sanders, and discharged about a pint (English) of thick, white purulent matter. This matter appeared to be merely collected in the axilla, from the neighbouring parts. The glands there never were much affected; and the matter flowed in large quantities when the shoulder and upper parts of the pectoral muscles were pressed. The fever and pain now abated somewhat, but still both continued severe. Wine now relished, and could be borne in considerable quantities. Every day during the following week, about half a pint of matter, discharged by slight pressure on the shoulder and pectoral muscles. A probe introduced at the aperture could, without giving almost any pain, be carried four or five inches in different directions, between the tendinous sheaths of the muscles. Notwithstanding that the patient drank nearly a bottle

of the best port wine each day, and had a liberal allowance of beef-tea, gruel, &c., by the 17th he was exceedingly reduced in body and in strength. The pain in the shoulder, though much diminished, still pretty severe. Cloths wrung out of hot water, and applied to the part, alone afforded relief. The fever appeared now to assume the hectic type, with profuse perspiration during the night. Got decoction of cinchona with nitric acid.

By the 20th December the discharge had diminished to about  $\zeta$ iv. per day, of a thin glairy nature. From this time both the pain and discharge decreased. Wine, decoction of cinchona, and acidulated drinks continued. Fever and sweating gradually subsided, and appetite returned.

By the 4th of January, patient could sit for an hour a-day out of bed. After this, his general health rapidly improved. About the middle of February the abscess closed. It was not, however, till nearly the end of May that he recovered his usual strength. The arm continued of little use for many months after this. A year and nine months have now elapsed since the accident took place, and, although the arm can be used with facility on ordinary occasions, the shoulder-joint is still stiff and painful upon any considerable exertion.

CASES XI. & XII.—*Derived from the Dissection of the same recent Subject.*

These cases occurred in two of the clerks of our Hospital, one of whom, a most accomplished and amiable gentleman, fell a sacrifice to the zeal with which he was prosecuting the study of the profession he had selected; and the other happily recovered after a very severe illness. For the history of Mr Hercey's case, I am indebted chiefly to Mr Macdonald, apothecary to the Royal Infirmary, having added only a few particulars relating to the last days of the patient's life, communicated by his most intimate friend Dr Barclay.

John Hercey, Esq. aged 34, residing in the Royal Infirmary, and senior Physician's Clerk, received, on Sunday 25th August 1821, a puncture in the ring-finger of the left-hand, when stitching up a dropsical subject, which he had been assisting to dissect, within 24 hours of the death of the patient.

During the afternoon of the following day he complained a little, and at night was seized with severe rigors, accompanied by thirst, prostration of strength, and other symptoms of constitutional irritation. Twenty leeches were applied to the arm, from the elbow upwards, and afterwards warm fomentations and poultices.

27th, noon.—Complains of considerable headache and sickness, with perceptible, though slight oppression, and anxiety of breathing; countenance somewhat collapsed, and expressive of anxiety. Pulse frequent; bowels opened by medicine. Does not complain much of pain in the finger, but a pustule has appeared where the puncture was made, and a distinct blush of redness, of about an inch or an inch and a half in breadth, extending from a little below the elbow to near the arm-pit. A circumscribed swelling has also taken place, embracing the arm around the elbow, and extending a little above and below the joint, but without any defined margin.

Notwithstanding he suffered much from his symptoms and constitutional irritation, he attended Dr Hamilton, and officiated at the visit.

28th, 10 A. M.—Passed a restless night. Swelling considerably increased, and the redness is spread over nearly all the extent of the tumified part, being evidently of an erysipelalous blush. The finger is nearly in the same state as yesterday. The affection of the breathing rather increased. Pulse frequent. Thirst urgent. Countenance more anxious; but is out of bed, and insists upon officiating at the visit at noon, although evidently very unfit for any exertion.

29th.—Arm continues to increase in size, and inflammation to spread in both directions from the elbow. The sore on the finger is of little consideration, giving no pain or uneasiness; no distinct



trace of inflamed lymphatics can be perceived extending along the fore-arm, and there is no tumefaction, or pain of the glands in the axilla. Has had retching and vomiting of bilious matter repeatedly since last night. Respiration anxious, and somewhat catching, but denies having any pain in the region of the chest. Pulse rapid. Thirst continues urgent. Anxious expression of countenance more marked, with evident sinking of features. Cloths, wet with solution of sugar of lead, and tincture of camphor, have been kept at the arm constantly for the last two days.

30th.—Restless night. Has had nausea; symptoms continue; swelling extending, and redness spreading.

31st.—Symptoms unabated. Is recommended to leave the Hospital, and to go to private lodgings, to which he was removed accordingly.

Sept. 1st.—Inflammation and swelling of the fore-arm increased, extending to the shoulder, and down towards the wrist. Several vesicles, some of an oblong, others of a more circular shape, appeared to-day on the back of the fore-arm, below the elbow, and along the outer and inner side of the arm, above the joint, the smallest of which is about the size of a sixpence, elevated, and the longest from two to three inches in length. Some are filled with transparent serum, and others with a thin fluid, but of a dark colour. The erysipelatous inflammation encircling these vesicles has assumed a dusky hue, which extends over the greater part of the arm, from

above the wrist, and upwards over the shoulder, but becomes gradually fainter as it recedes from the bases of these vesicles. Thirst urgent. Pulse frequent, and febrile symptoms aggravated.

2d.—Very restless night, but declined taking an opiate, which had been prescribed. Considerable nausea to-day, especially after taking liquids. Bowels have been opened by medicine. Inflammatory hue, deepening in tint, extends over the deltoid muscle, and from the breast backwards over the shoulder. The region of the deltoid is also occupied by vesicles similar to those already described, varying in size, and filled with a dark serous fluid. Some of the vesicles on the arm were opened, and some have burst. The swelling has diminished in the lower part of the fore-arm, but, on the whole, the symptoms are in no respect improved.

3d.—State of the arm not improved. Most of the vesicles have burst, and have discharged such quantities of fluid as to penetrate the bed, and run upon the floor. Had an obvious tendency to delirium during the night, and, to-day, is distinctly observed to waver occasionally. No improvement in any respect.

4th. — Had a very restless night, with frequent copious vomiting, of a dark coloured matter; but about 5 in the morning he called for his breakfast, conversed with his landlady, said that he never should forget her attention, and ate to all appearance with an appetite; but expired at half-past 6 A. M.

*Treatment.*—The solution was continued to the arm; a few laxative pills were given. On the evening of 1st September, a little claret was ordered, of which he accepted with reluctance, but the nurse persevered in giving him a little occasionally. On the evening of the 2d September, a grain of solid opium was prescribed. Had a little tea and panada for food, and barley-water for drink.

Body not examined.

Dr Hennen *junior*, another of the Hospital clerks, was severely affected, in consequence of a puncture received in dissecting the same body. An extensive suppuration took place in the axilla; and he was greatly reduced, but at last his recovery was complete.

CASE XIII.—*Fatal; from Dissection.*

Dr Dewar, a resident Fellow of the Royal College of Physicians of Edinburgh, wounded a finger of the *left* hand slightly, when examining the body of an enteritic patient, on Monday the 13th February 1823, and immediately applied caustic to the wound. He attended a meeting of the Royal Society in the evening. On Tuesday he remained in bed, complaining of languor, general debility, and affected with rigors. On the 16th, the *left* axilla became exceedingly painful, without much swelling of the part, or any hardness in the course of the absorbents on the arm. Leeches were applied to the axilla,

with great relief to the pain. On Saturday, at 3 A. M., one of his medical friends was sent for, on account of an accession of pain in the *right* forearm, with some swelling and redness. Leeches were immediately applied, which bled freely, but without affording any relief, for the inflammation and swelling extended rapidly. At 5 P. M. he was bled from a vein in the arm, and the blood was sizzly, without much separation of serum. Early in the morning of the 19th, he became insensible, and he died at 9 A. M. The symptoms throughout were those commonly called Typhoid, and the treatment strictly antiphlogistic.

Body not examined.

CASE XIV.—*From Dissection ; not fatal.*—Communicated by Dr FAIRBAIRN.

Mr Cumming, a medical practitioner in this city, was present about 1 P. M., 30th September 1821, at the dissection of a young woman who died from puerperal fever. Took no share in the dissection, except introducing a fresh thread into the needle which was employed in sewing the body, and was not aware of an abrasion, or of having punctured himself in the act of threading. About eight hours thereafter felt an uneasy sensation in the middle finger of the *left* hand, at the inner side of the flexure of the first joint, where, on examination, there was discovered an angry pimple. Passed a restless night ; towards the morning had a severe rigor, to which supervened symptoms of pyrexia.

On Sunday the 1st October, about 11 A. M., Dr Fairbairn was called to visit Mr Cumming. On the finger, as above described, a pimple was seen, from which there oozed out a sero-purulent fluid. A poultice was ordered. The arm exhibited no marks of inflammation, but about an inch above the internal condyle of the humerus, an enlarged gland, painful to the touch, was distinctly felt. On the following day (Monday) the parts about the axilla, and under the pectoral muscle, were greatly swollen, painful on being handled, and conveyed an elastic feeling to the finger, accompanied by fever, violent headache, and great constitutional disturbance.

He was bled four times from the arm ; had two dozen of leeches applied twice to the shoulder ; and an anodyne astringent wash ordered to the affected arm. The skin was kept relaxed by diaphoretics ; the bowels open by cathartics ; and spare diet was enjoined.

Under this treatment, in four or five days, the symptoms had greatly subsided ; the fever was much lessened ; the headache relieved ; and the swelling of the arm and axilla so much reduced, that he could move the arm freely. This amended state continued for a day or two, with the exception of an uneasy feeling, first complained of on Thursday the 5th October, in the *right* fore-arm, which was considered rheumatic, from his predisposition to that disease, and being near a window, he may have been exposed to a current of air ; but there was not the smallest tumefaction or inflammation anywhere observable. On Saturday evening the 7th, a deep-seated

swelling, of the size of a pigeon's egg, was discovered in the same arm, nearer the wrist than the elbow. It was circumscribed, with some redness, and painful on pressure. Sunday, the swelling had increased considerably, occupying nearly the whole fore-arm, with an erysipelatous appearance, pulse at the wrist obscurely felt. Monday, the tumefaction had increased to an alarming extent, from the extremities of the fingers to the *acromion scapulæ*. Temperature and sensibility of the parts affected much diminished, which were covered with gangrenous vesications.

On the following evening, between 11 and 12 P. M., being the 11th day after the dissection, he died.

Body not examined.

CASE XV.—*Resembling Paronychia gravis*.—Communicated by Dr FAIRBAIRN.

This case is interesting, on account of its connection with the preceding, as its occurrence increases the probability, that the disease in both instances arose from inoculation with an animal fluid derived from the same body.

A towel that had been used in place of a sponge, during the dissection in which Mr Cumming met with his fatal accident, was washed in the evening by Mrs Edie, who got the middle finger of the left hand, at the first joint, scratched with a pin which had been in the towel. She felt the part painful the next day, had shivering and headache, with pyrexia. Inflammation and swelling soon extended from the

finger up the arm, attended with excruciating pain. She was bled, and had a dose of salts. Dr Fairbairn saw her on the fourth day from the accident.

The inflammation and swelling were then as high up as the elbow, with an erysipelatous appearance; several glands in the inner side of the humerus and axilla were enlarged, and painful on pressure. The constitutional symptoms were severe. She was bled twice, had diaphoretics and cathartics administered daily. Under this treatment, the inflammation was partially checked, the fever somewhat subdued. At length an indistinct fluctuation was felt in the palm of the hand; and, on a free incision being made, a quantity of purulent matter was discharged. A second incision was made in the back of the hand, between the carpal bones of the fore and middle fingers, and a third along the palmer side of the punctured finger. Notwithstanding these different openings, severe rigors now and then occurred; the other symptoms, although mitigated, were by no means subdued. Dr Fairbairn therefore resolved on laying open the finger down to the bone, thinking that matter was lodged between it and the flexor tendons; this being accomplished, a bloody purulent matter was discharged; the swelling and inflammation soon subsided, and the wounds healed kindly.

CASES XVI. & XVII.—*From Dissection; slight.*—Communicated by Dr MOLLESON.

Mr W. D. student of Medicine, pricked his finger on 25th November 1822, when engaged in

dissecting a body rather putrid, and supposed to be scrofulous. Next morning a slight degree of pain was felt in the part, and a blush of inflammation observed around the puncture. He attended lectures during the day, but towards evening the pain and local affection increased so much, that he was obliged to seek medical assistance; but the system was not as yet affected. Dr Molleson ordered the application of leeches directly upon the part, poultices, and a saline purgative.

The leeches were ill applied, and gave but transient relief. He passed a restless night, and on the 27th was much worse. Pain insufferable, extending with tenderness to the touch to the axilla. Inflammation creeping up the finger. Arm, especially towards the axilla, tumid. Axillary glands, and a conglobate gland above the inner condyle, considerably swelled and tender. Pulse 96, full and remarkably bounding. Great heat, restlessness, anxiety, nausea, and white tongue. A deep incision, an inch long, was made by Dr Molleson along the point of the finger, where it was most tumid. It bled little, but soon gave him much relief. Blood was now taken from the arm in a very full stream, but when 12 oz. were abstracted, faintness was produced, though the patient was laid in the horizontal position. The affection of the system was, however, greatly and permanently relieved.

On the evening of 29th November, increased pain and swelling of the axilla, which proceeded to suppuration, and the abscess was opened on 6th De-



ember, which discharged a tea-cupful of matter. In a few days he resumed his studies.

Mr A. B., a student of Medicine, when engaged in dissection, had a little cuticle abraded from his finger 19th November 1822. For two days a little watery fluid oozed from its surface. On the evening of the third day wound whole, but pain felt in the axilla; and lymphatics, in an inflamed state, could be distinctly traced from the wrist up to the shoulder-joint.

22d.—Unable to raise the arm from the pillow. Passed a very restless night. Severe headache; vomiting urgent. Tongue parched. Great thirst. Pulse 108, full and strong, with the other symptoms of violent symptomatic fever. 20 oz. of blood were drawn from the arm with immediate relief; but, after two hours, the headache and vomiting returning, the arm was unbound, and 12 oz. more were taken, with relief as before.—8 P. M. Violent pain in the axilla, with some swelling of the glands; eight leeches were applied, and then cold lotions continually to the part, and the antiphlogistic regimen strictly adhered to.—23d, Much worse. Delirious night. Pulse 116, irregular. Axillary tumor increasing. Leeches repeated. Lotions continued.—24th, Pain violent, increased by the cold lotions; warm poultices and fomentations were substituted. Pulse 118, irregular and weak.—28th, Pain not so violent. Tumors increasing. Wine allowed.

1st Dec.—Pain in the axilla almost gone. Fluc-

tuation in the tumors. Some rigors and shivering. Pulse ranging from 130 to 160.—3d, Tumor opened, and discharged 7 oz. of pus, and 6 oz. more in the evening.—4th, Profuse perspirations.—10th, Much improved.—11th, Able to go out.—On the 25th and 26th, was able to walk with ease; but the motion of his arm was still limited; and, in June 1823, he wrote that his arm was still unable to perform all its functions, but that, of late, a very extensive eruption had come out on it, which had done it great good.

CASE XVIII.—*From Dissection; severe, not fatal.*—  
Communicated by Mr BURTON.

Mr Burton, on the 1st of January 1821, was engaged, about noon, in examining the unburied body of a person who had died of aneurism. In the evening about 6, he felt drowsy, but went into society. At 10 P. M. he observed an areola around a puncture on his knuckle, and applied a poultice over his hand. At midnight he was seized with severe pain, and recollecting the practice in America, when any person is bitten by a rattle-snake, he tied a ligature very tightly around his arm.

In the morning he removed the ligature.

2d.—There was great swelling of the hand, and he felt very languid. In the evening the inflammation was extending up the arm, and numerous red lines were seen reaching up to where the ligature had been applied, and they could be felt like whipcords under the surface.

3d.—The fore-arm seemed affected with general erysipelas, which continued to increase; but it is not a little remarkable, that its progress up the arm terminated at the part around which the ligature had been applied.

14th.—Erysipelas declined.

15th.—Exceedingly low, and he began to get wine. Livid spots of the part affected with erysipelas suppurated.

16th.—Sloughs began to come away in the evening. After this, suppuration, ulceration, and sloughing continued for a considerable time, with loss of skin, cellular membrane, and Mr Burton thinks even of muscular substance. He was also subject to a kind of delirium, when fatigued by the dressing of the sores. He did not recover finally till August, and, at present, his left fore-arm is considerably smaller than the right; his wrist has little motion, and his hand, which at first was flexed, is now extended. There are large scars both on the hand and on the fore-arm, with adhesion of the skin in various parts, particularly near the wrist, to the parts beneath. On drawing the finger across the scars on the fore-arm, a singular tingling sensation is excited in the hand, as if an exposed nerve were irritated by it.

CASES XIX. & XX.—*From Dissection and Puncture; not fatal.*—Communicated by Mr LIZARS.

“ Mr S., one of my pupils, assisted in the dissection of a puerperal fever case, when he pricked

his fore-finger, and in the evening had shivering, and general pyrexia. The following morning I saw him, and found the fever considerable, and the hand inflamed and swollen, with a tenderness along the arm to the axilla; I instantly bled him to syncope, applied large poultices to the hand and arm, renewing them whenever they became cool; ordered his bowels to be kept open, and to have low diet, and to be kept quiet. In the evening he was easier, but not so much as I expected; I therefore repeated the bleeding to syncope, and continued the other remedies and directions. The fever and pain declined from this last bleeding, but two small suppurations took place in the back of the hand, which were freely opened, and soon healed. Mr S. is now quite well. This case occurred in January 1822."

A sheep's head was prepared for Mr M., one of my pupils, by the servant, who removed the skin with a clean knife, and washed the head under the cock of the water-cistern, not in the trough beneath. Mr M. then sawed the cranium, and in lifting up the skull-cap, he pricked the fore-finger of his right-hand with a spicula of the bone; the wound smarted a little, but not so much as to prevent him pursuing the dissection of the brain. The following, or second day after, considerable inflammation attacked the finger, and spread along the hand and arm; a poultice was applied, and repeated whenever it became cool; and a pretty copious bleeding

taken from the opposite arm. I did not see him until the day after this bleeding, when finding the arm very painful, and accompanied with fever, I recommended the bloodletting to be repeated, and carried to syncope; and the poultices also to be continued; low diet, the keeping the bowels gently open, and quietness, were enjoined. The finger suppurated, and required an extensive opening; the palm and back of the hand also suppurated; and both required similar treatment. The forefinger is now so stiff that he cannot bend it like the other fingers of the same hand. This accident occurred in spring 1822."

CASE XXI.—*Fatal; from a Prick with a Flesh-Hook.*—

Communicated by Dr ABERCROMBIE.

15th Dec. 1821.—Mrs Hodge run a flesh-hook into the point of the thumb of her right hand, while hanging up a piece of meat. Made an open ragged wound, of very little depth.—16th, Felt some pain in the thumb, but not severe.—17th, Felt pain in the arm *above* the elbow. Thumb better.—18th, First seen in the evening by Mr Page; having become feverish, and generally unwell, in the course of the day. Pulse then 120. Arm, betwixt the elbow and shoulder, a little swelled, and painful to the touch; and some pain extending down the side of the thorax. No complaint of the thumb, which exhibited merely a ragged, su-

perforated wound, of very little depth. Was bled, &c.—19th, Pulse 100. Arm still painful, but less so than yesterday, and seemed generally relieved.—20th, Pulse 116. Considerable pain of side, with cough, and some difficulty of breathing. Tongue clean.—21st, Pulse 120. Pain and tenderness of the right side of the neck, extending from above the clavicle, along the neck, to the back part of the head. Slight delirium. Tongue clean.—22d, Delirium increasing. Some difficulty in speaking. Pulse 120. Bled again.

I saw her, for the first time, in the afternoon of this day. She then had the general appearance of typhus, and scarcely could be made to answer a question sensibly. She shrunk from the slightest touch on the right side of the neck, and above the clavicle. These parts were swelled, but scarcely discoloured. No complaint of any part of the arm. The wound of the thumb was merely like a laceration of the cuticle.

23d.—Constant delirium, and a tendency to coma. Pupil of the right eye dilated; and at times there was observed convulsive twitches of the mouth, and an appearance of paralysis of the right cheek. Pulse very frequent, and small. The same tenderness continued along the right side of the neck. Died early in the morning of 24th.

*Dissection.*—On laying open the parts on the right side of the neck, the cellular membrane appeared thickened, and extensively diseased. The muscles dark coloured, and very soft. There was a

considerable quantity of thin sanious fluid, partly puriform, discharged from all the exposed parts, without the appearance of any particular cyst or abscess. The lymphatic glands were a little enlarged, and those in the axilla considerably so; and from the incision made into the axilla, there was the same discharge of thin sanious or puriform fluid as from the neck. Nothing morbid could be discovered either in the arteries, veins, or nerves of the parts. No morbid appearance could be detected in the brain, or in any of the other viscera.

CASE XXII.—*From a Bruise; fatal.*—Dissection communicated by Mr MACDONALD, Apothecary to the Royal Infirmary.

Alexander Sutherland, æt. 75, was admitted into the Royal Infirmary after the visit on the 6th of August 1823, in a state of delirium. The whole of his right-hand was very much swollen and inflamed, and there was great œdema, with some small vesicles on the back part of the hand. The swelling and inflammation extended up the fore-arm, which he could hardly bear to be touched. Pulse 130, full. Tongue crusted. Skin hot and dry. Thirst considerable.

These complaints were occasioned by the little finger of the left hand having been very severely bruised by a large piece of coal which fell upon it about a week ago. During the last three days the symptoms have been alarming.

He got a purgative bolus, and his arm was fomented with a decoction of poppy heads.

7th August.—He passed a composed night. Cathartic operated briskly. Hand and fore-arm much inflamed and swelled. Pulse 108, irregular. Tongue parched.

The fomentation was directed to be continued, and an antimonial solution was prescribed; but he died at 10 P. M.

*Dissection.*—9th August.—Along the inside of the arm, in the course of the inflammation from the wrist to the axilla, and down the side of the thorax for a considerable way, the cellular membrane was found, by removing the integuments, and reflecting the *pectoralis major*, to be surcharged with serum, in some places tinged of a brown colour. A degree of redness, in the form of striæ, was observed in some places; and at the wrist, and a little above it, in a line, on the inside of the ulna, there was a small quantity of pus in detached circumscribed longitudinal patches in the cellular membrane. On dividing one of the large axillary glands, a small portion of pus was found in its centre, although there was none on its surface, and the substance of this gland was paler than several other glands in the axilla, which, upon being divided, seemed healthy, and more of a brown or red, approaching to flesh colour. A portion of the muscular structure at the axilla was paler, softer, and more flabby, than the sound part a little beyond, and the intermuscular cellular tissue may have been here also a little



charged with serous effusion. There was no distinct line of demarcation discovered, as if adhesive inflammation had taken place, and confined the serum within boundaries. In the thorax there was no interstitial, or other effusion; but between the arachnoid coat and *pia mater* of the brain, and in its ventricles, there was some serous effusion; otherwise the brain was healthy.

CASE XXIII.—*Resembling* Phlegmatia dolens; *fatal*.

Catherine Monro, æt. 26, married, admitted into the Clinical Ward, under my care, 3d June 1816. The nates, thigh and leg of the right side were considerably swollen, not very tense; the surface was even, and the skin of its natural colour. No indentation remained after pressure, except around the ankle. The heat of the limb felt increased, and pungent. The whole limb was very painful, tender to the touch, and she was incapable of moving it. Some glands in the groin were slightly enlarged, but she had no pain from them. Pulse 140. Heat  $104\frac{1}{2}^{\circ}$ . Tongue dry and white. Appetite impaired. Bowels regular from medicine.

Six weeks ago she was delivered of a child, and the labour was difficult. Two days afterwards rigors came on, succeeded by great heat, pain and swelling of the right thigh, which gradually increased. Embrocations were applied to the part, but they afforded her no relief. She had an ab-

scess in the right breast, which was now healed, but she had not been able to suckle her child.

4th June.—No sleep, from excessive pain.

Eight leeches were applied to the groin, which fastened chiefly on the inside of the thigh, and procured the discharge of a very great quantity of bloody serum, which relieved her much, and she slept well during the night.

5th.—Awoke much refreshed, and complained little of pain, but only of inability to move the leg. Serum continued to ooze from the leech bites, and her pulse had fallen to 128, and the heat to 100°. Her bowels, which were confined, were freely opened by a purgative draught, and a blister was applied to the thigh.

6th.—The blister rose well, and discharged a great deal of serum; but its irritation prevented her from having any sleep, and her pulse had risen to 152, accompanied by thirst. The swelling of the thigh, however, seemed less, and she made no complaint of pain.

The blister was ordered to be dressed with poultice, and she got five grains of the *Pilul. Calomel, c. Camphora* twice a-day, and *gtt. xv.* of the *Tinct. Digital.* three times a-day.

9th.—Blister had discharged a great deal of serum; now almost healed, having been much relieved by the poultices. She now complained of the sacrum being bruised from lying on it.

A lead plaster was applied to the excoriation

with relief; and she was allowed a pound of good beef-tea daily.

10th.—Tolerable night, but she was seized with severe pain below the knee. Diarrhœa succeeded to costiveness. The digitalis was now omitted, and the knee was rubbed with anodyne liniment.

11th.—Leg still painful below the knee, and swelled, but pitted readily on pressure; the thigh also pitted more than formerly.

13th.—Considerable discharge of serum, from a blister applied below the knee.

14th.—Good night. Leg less painful. Discharge of serum continued. In the upper part of the thigh there was a distinct fluctuation in a circumscribed space of considerable extent. Pulse 132, moderately full. Heat 102°. Tongue clean, but rather dry. Mouth aphthous. Excoriation on the back looking worse; it was dressed with egg liniment; and she got port-wine, bark mixture, and an anodyne draught.

16th.—Abscess in the thigh opened, by means of a trocar, and about fifty ounces of well digested pus were discharged. She felt little relief from the operation, but rather more debilitated.

17th.—No sleep, and the wound continued to discharge very abundantly.

20th.—The discharge from the thigh had ceased, but the whole of that side was very much swelled; and she complained much of the knee, on account of pain and swelling. Bruise on the sacrum spreading.

21st.—Abscess had again opened, and the discharge was very profuse. The whole limb, down to the toes, pitted readily on pressure, and gave the sensation of a fluid over the muscles.

After this, colliquative diarrhœa began,—the discharge from the thigh continued;—the bruise on the back extended;—aphthæ became more numerous in the mouth,—and she sunk, hectic and exhausted, on the 7th of July.

*Dissection.*—The abscess of the thigh was found to extend from the crista of the ilium to within three inches of the knee; and the internal surface of its parietes was in a sloughing state. No other marks of disease were observed. The uterine system was perfectly healthy, and all the other viscera sound.

CASE XXIV.—*Resembling* Phlegmatia dolens; *not fatal.*

The next case of this affection occurred in a young lady, but as I kept no notes at the time, I can state only the general circumstances.—A small tumor was removed from the upper part of the foot of a young lady, and the sac in which it was inclosed was dissected out. At the time of the operation, she suffered more pain than the extent of the wound would have led us to expect; and in particular, she begged her foot to be held firmly, and complained of a pulling and dragging sensation. The wound itself

did well, and gave us no more uneasiness. Some days, however, after the operation, she was affected with a considerable degree of fever, which was ascribed to irritation, and treated accordingly; but the foot looking well, and no mention of any other affection being made, we did not suspect the mischief which was going on.

She next complained of severe pain in her knee and thigh, but we were not then allowed to examine them, and anodyne lotions and fomentations were applied, with temporary relief; but the swelling and pain increasing, along with the febrile irritation, we were at length permitted to examine the limb, and found a general swelling of the whole, especially from the knee upwards, exceedingly painful, not pitting on pressure, but firm and solid, without redness or tendency to point; in short, I cannot describe it better than by comparing it to the state of the limb in *Phlegmatia dolens*.

It was treated principally with leeches, of which a considerable number was repeatedly applied, and by warm fomentations. After some time her health improved, and the disease seemed to be entirely local.

At last, as there was nothing at all resembling the pointing of a phlegmon, or any protrusion or prominence of any particular part, an opening rather unexpectedly occurred in the middle of the inside of the thigh, which gave vent to a great quantity of healthy purulent matter. This was evidently not furnished from any circumscribed cavity, but for

many days it was necessary to press it round from the whole extent of the thigh, even on the outside, as low as the knee, and as high as the trochanter. After this, a phlegmonic swelling pointed in the groin, which suppurated and burst, and there was a threatening of other circumscribed inflammations, one below the knee, and another above Poupart's ligament; but these dispersed without suppuration.

The convalescence was slow, the discharge from the first opening gradually lessening, and her strength returning; but the recovery has been complete, without the least weakness or stiffness of the limb remaining.

CASE XXV.—*From a Sprain; fatal.*—History communicated by Dr PITCAIRN.

J. B. æt. 21, of a robust make, but of sober habits, on the morning of the 25th June 1823, in endeavouring to raise a stone, which was by far too heavy for him, felt something in his right axilla (as he said) give way, and from that time he complained of severe pain in that situation. The next day he continued at his work, but the pain was still severe. On the 27th, Dr P. saw him, when he was complaining of most violent pain in the axilla, extending a little towards the breast. His face was very anxious. Pulse 156. Had great headache, and thirst, and was a little delirious through the night. On examining the axilla, there could be

perceived a deep seated gland swelled to about the size of half a walnut. Twelve leeches were applied immediately; had a large dose of Sulphate of Magnesia, and was ordered a solution of  $\frac{1}{8}$  of a gr. of tartar emetic every three hours.

28th.—Was greatly relieved; the pain was not nearly so acute. However, he had a violent accession of his former symptoms; there was now manifest redness of the integuments of the axilla, and of those covering the pectoral muscle. Other twelve leeches were applied.

29th.—Pain is extending very rapidly in all directions; pulse 148. The redness reaches now as far back as the spine; forwards to the insertion of the pectoral muscle, and downwards over the nates. Was bled to  $\bar{\zeta}$ xiv. There is now a doughy feel, with very deep seated sense of fluctuation. A very deep incision was now made in the seat of the fluctuation, at which issued blood, and a very small quantity of puriform discharge. Cicuta poultices were ordered to be applied, and frequently repeated.

30th.—No better; pain excruciating. The discharge of bloody serum by the opening has been enormous.

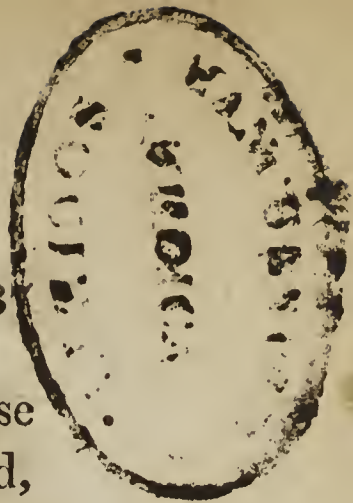
1st, 2d, and 3d July.—Continued very much in the same way; and on the evening of the 4th he died much exhausted.

*Dissection.*—The body was examined twenty-four hours after death, by Dr Hunter, in the presence of Dr Pitcairn and myself. On stripping the body, the whole of the right side was swollen

from the clavicle to the crista of the ilium. The swelling had no very defined margin, but it seemed to cease at the mesial line over the sternum, and at the anterior edge of the external oblique muscle anteriorly, and to extend backwards perhaps to the spine. The lower edge of the scapula was raised as if by something beneath it. From the axilla to within an inch or two of the crista of the ilium, the cuticle was loose, and in some parts removed, and the exposed cutis was of a livid red. On the scapula, breast and shoulder, the skin was entire, and of its natural colour. The abdomen was tympanitic, and much bloody froth was working out at his mouth and nostrils. There was also a copious discharge of bloody serum, from the puncture which had been made in his side.

The dissection was commenced by making one long and deep incision from the axilla to the os ilium, another from the axilla to the clavicle, and a third from the same point backwards along the lower edge of the scapula, and was prosecuted by deepening the incisions in the parts most diseased. The extent of disease thus displayed was dreadful. The *cutis* every where was swollen and pulpy. The cellular substance, subcutaneous and intermuscular, was much thickened, vascular, turgid with bloody serum, or loaded with reddish purulent matter, which exuded abundantly; and the subcutaneous fat, in consequence of interposed effusion, was seen lying in small distinct masses, as may be often observed in anasarca. The muscles were paler than





usual, and very tender. On the side, over the false and lower ribs, where the skin was most affected, the effusion consisted of serum without any intermixture of purulent matter; but in the region of the pectoral muscles, and of the scapula, the disease was deeper seated, and its progress appeared more advanced. In the substance of the *pectoralis major*, and between it and the *pectoralis minor*, purulent matter abounded, but it was diffused throughout the cellular texture, and not confined in any cyst or abscess. The disease was in its worst form in the axilla, and it burrowed deep beneath the *latissimus dorsi*, and between the *subscapularis* and *serratus magnus*, penetrating every where, not only between their digitations, but among their densest fibres. The glands in the axilla were enlarged, but not suppurated. The periosteum did not possess its natural adhesion to the ribs, but on being divided near their sternal extremities, it retracted and was easily lifted from them. The disease did not extend to the muscles on the humerus, at least the *biceps* and *triceps*, and I think the deltoid, were sound. The basilic vein was particularly examined, and found in no respect different from its natural state.

CASE XXVI.—*Cause uncertain; fatal.*—Communicated by Dr HAMILTON, Senior Physician to the Royal Infirmary.

4th March 1821.—Catharine Reid, æt. 46, nurse

Men's Operation-Ward. Has severe pain of forehead; also in the left side of the chest preventing full inspiration; has slight cough; general soreness of body; prostration of strength, frequent rigors, succeeded by heat of surface. Pulse 96, good strength. Belly open from medicine; much nausea and loss of appetite. Tongue white. Thirst considerable; surface warm and dry; countenance flushed.

Was seized with rigors, headache and weakness of limbs on Thursday the 1st. Rigors have frequently recurred, the last time early this morning. On the 2d, took a vomit, with some relief, and this day castor-oil, which has operated.

5th.—Headache easier; rigors have not recurred. Pulse 90, full and sharpish. Other symptoms as before.  $\zeta$ xvi. of blood were drawn from the arm.

6th.—Indifferent night, pain of side continuing, and being aggravated towards morning, about  $\zeta$ xiv. of blood were drawn, first portion slightly sizzly, last more so. A blister was also applied to the affected side.

Noon.—Pain of side continues, and there is a painful diffused swelling over the left side of the neck, of the same standing with that of the side. Pulse feeble. Countenance scarcely flushed. No alvine evacuation.

An injection ordered.

7th.—Pain of side continues, but respiration is easier. Swelling observed yesterday extends over the superior part of the chest, is colourless, but painful

upon pressure, slight patches resembling ecchymosis upon different parts of the body. Pulse 120, and small. Tongue clean and moist. Aspect of countenance improved. Bowels moved.

8th.—Died at 4 A. M.

No Dissection.

CASE XXVII. and XXVIII.—*Cause uncertain ; fatal.*

—Communicated by Mr MACDONALD.

16th June 1822.—Mary Ross, night-nurse, Surgeons' Ward, complains of headache, pain of small-of-back, nausea, and inclination to vomit. There is a soft, rather doughy diffuse swelling, with ill defined indistinct margin, and of considerable magnitude, situated between the humerus and sternum, extending from the clavicle over the upper part of the breast and mamma of the left side. The integuments are of their natural colour over the diffuse swelling, which is very tender and painful even to the touch. Countenance expressive of considerable anxiety. Face flushed. Respiration a little accelerated, but not in a marked degree, and full inspiration does not seem to produce any deep seated pain in the chest. Pulse 120, full and soft. Tongue loaded. No alvine evacuation for two days. Great thirst. Skin natural.

Began to complain yesterday morning, and first observed the swelling this morning. Is unable to ascribe any cause for her complaints, but received a

pretty severe cut in her thumb a few days ago, when cutting grass,—has been since employed in attending erysipelatous patients, but being night-nurse, had little to do in dressing them; nor was there at this time any reason to suppose that her thumb, which healed kindly, was in any way exposed to matter from any description of sore.

17th.—Considerably easier since her breast was fomented,—was bled, but not above 12 oz. could be got. Salts have produced three scanty very dark coloured stools. Lies much on her back. Countenance anxious.

18th.—Swelling and pain above the mamma somewhat subsided,—that in the mamma itself considerable. Little or no pectoral symptoms. Bowels open from senna.

19th.—Six leeches relieved the pain of mamma, but has still pain of left humerus on moving, and the general fulness of the mamma, and even the *pectoralis major* still perceptible. Pulse 94. Tongue foul. Belly slow. Occasional nausea.

20th.—Lies chiefly on her back. Countenance anxious. Pain of swelling aggravated. Twelve leeches to be applied.—*Vespere*. Pain of breast increased, with inability to draw a full inspiration. Pulse 120, pretty full. Face flushed. Countenance very anxious. Bled to 20 oz.

21st.—Blood in first cup sizzly. Pain at present seems inconsiderable.

22d.—Several stools from an enema. Very little

pain complained of any where. Pulse 120. Skin moist, but hot. Tongue clean and moist.

23d.—Pulse 100, and sharp.

24th.—Considerable swelling and hardness round the left mamma, with aggravation of pain, which extends to the shoulder. Pulse near 120. Leeches applied. Effervescing draughts, with hyosciamus.

25th.—Rather a better night, but complains still of pain of breast. Pulse 120. Tongue pretty clean.

26th.—Some purging. Pulse 120. Countenance pale and anxious. Breathing quick,—a poultice applied to the breast,—considerable fulness, but no redness. Camphorated emulsion.

27th.—Had a good deal of sleep. Swelling about the mamma not quite so full, and does not complain of much pain. Pulse 120. Skin hot. Three stools. Thirst.

28th.—Again delirious last night. Four dark coloured stools, partly passed in bed. Pulse 120. A livid spot has appeared on the sacrum.

29th.—Died at 8 A. M., fifteenth day.

Mr Macdonald remarked, that, during the whole progress of this disease, the patient never coughed, and preferred lying with the head low, chiefly on the back, sometimes, but rarely, on the side. Breathing was considerably oppressed, especially during the latter days of the complaint.

By the strictest inquiry, Mr Macdonald was satisfied that, in this case, the nurse was not exposed in any way to be affected by any patient in the ward.

*Dissection.*—Before commencing the dissection, upon pressing the finger along the course of the vein in the left fore-arm, from which she had been bled, a considerable quantity of pus issued from the site of the orifice of the vein, if not from the vein itself.

Upon removing the integuments of the fore-arm, and also of the shoulder, and along the region of the deltoid, back of the scapula, and pectoral muscles, there was, deep-seated among the muscular substance, a very extensive separation of purulent matter, not confined by any boundaries or cellular adhesions; perhaps the greater part of this was over the breast, below and between the layers of the pectoral muscles. There were also cavities in the back of the shoulder that admitted one or two fingers, leading in different directions, filled with purulent matter. There was likewise matter, but in small quantities, along the fore-arm, as if in points here and there. The vein was not traced very distinctly, part of its coats was apparently thickened, but it was not ascertained that there was purulent matter in any part of it. There was a considerable quantity of pus about the elbow-joint. The pus on the fore part of the chest dipped deep at some places among the intercostal muscles, but did not seem to penetrate completely through into the chest. In the chest itself, on the same side, there was a considerable quantity, perhaps 1 lb. or more, of a dirty yellow liquid, with flakes of lymph mixed with it. The lungs on this side were covered with a very thick and extensive coating of lymph, and were compressed by the

fluid mentioned. On making an incision into the substance of the lungs, a very considerable quantity of frothy serum was effused. No recent disease in the left side of the breast, abdomen, or pelvis. Head not examined. Pericardium contained a little more serum than usual. Heart small, and more fatty in its substance than common.

A third nurse, the successor of Reid, died about two months after her, of the same disease, and under circumstances precisely alike, but the journal in which the history was inserted could not be found.

CASE XXIX.—*Fatal; cause unknown.*—Communicated by Dr NELSON, Denny.

A maid-servant in the country, 36 years of age, who, during the preceding ten years, had been repeatedly attacked with *Cynanche tonsillaris*, complained, on Saturday morning 4th August 1821, of intense headache, and went to bed. She remained in bed the greater part of Sunday, and on Monday rose to her work, but was unable to remain out of bed. She made some complaint of her arm, but it could not be very severe, as she still continued to milk a cow morning and evening, though she did no other work. She passed a very restless night on the 6th, and early on the morning of the 7th complained of intense pain in her left hand. On the

8th, she was seen by Dr Nelson from Denny, who found her complaining of insufferable pain along the radius of the left arm, stretching towards the shoulder: there was much swelling in the fore-arm, and considerable redness, but the inflammation seemed to Dr Nelson to be much more of the phlegmonous than of the erysipelatous kind. She was in a very strong fever; the pulse remarkably strong, and the tongue very foul. Dr Nelson, convinced that there was inflammation in, or very near the radius, tending to suppuration, and that the pain and violent constitutional symptoms were produced by the confined situation of the disease, proposed cutting down to its seat, but the patient would not consent. He then took a large quantity of blood from her arm, gave her a purgative, and ordered an emollient poultice to be applied to the whole fore-arm.

On the morning of the 9th Dr Nelson found her not at all relieved, and the poultice had not been applied. He again, but in vain, urged the necessity of a free incision; and having seen decidedly good effects from compression in one case of the same disease, in the tibia, or its investments, and in what he considered as a similar affection, upon a smaller scale, for example, in whitlow, he applied a roller very tightly to the arm, from the points of the fingers to the elbow. After a very few minutes, the patient said she felt much relief from the pressure, and Dr Nelson left her with directions that the bandage should be kept applied, and if the pain returned that it should be made tighter. The pain, however, soon



became excruciating, and, at the earnest desire of the patient, the bandage was loosened. Above the bandage the arm was observed to be very much swelled and inflamed. Her mind was now greatly depressed, and she was removed in a cart to the house of a relation about two miles distant, where Dr Nelson saw her on the 10th. The bandage had been removed, and the old remedy in erysipelas of flour and tow substituted. She had not quite so much pain, but the inflammation of the arm was become much darker, her pulse much weaker, and her countenance sunk. Several vesicles of considerable size, containing a dark coloured fluid, were scattered up and down the arm, both above and below the elbow. Dr Nelson directed the application of yeast poultices to the arm, but the patient died early in the morning of the 11th.

The affection could not be traced to any cause; but at the time the girl was taken ill, her mistress was affected with whitlow, which then prevailed very much in the neighbourhood. Erysipelas did not.

CASE XXX.—*Severe; cause unknown.*—Communicated by Dr FAIRBAIRN.

J. F. about the middle of October 1821, in the course of the evening, complained of sickness and shivering; passed a restless night; next morning was attacked with headache, nausea, and general uneasiness, with deep-seated pain in the left breast

and axilla, which, on inspection, were found to be swollen, inflamed, and painful on pressure. In the course of two or three days, the swelling and inflammation had increased considerably, assuming the appearance of the erysipelas phlegmonodes, with smart fever, and great constitutional disturbance. About the seventh day, the tumefaction extended from the *acromion scapulæ* to the sternum; it conveyed to the finger a boggy feeling, was extremely painful, and pitted on pressure. At this time the fever and headache were severe; the face was flushed; there was slight delirium, with great constitutional derangement. He was treated actively by bloodletting, diaphoretics, and cathartics, and a cold astringent lotion was applied to the inflamed parts. About the 9th or 10th day, an indistinct fluctuation was felt a little to the right side of the nipple, from which, on being punctured by a common bleeding-lancet, there oozed out a small quantity of pus; this being the case, a free opening was made by a bistoury, and a copious discharge followed. On introducing a probe into the wound, it passed readily backwards (nearly its whole length) to the shoulder, forwards, to the sternum, upwards to the clavicle, and downwards to about the eighth rib, shewing the immense extent of the cavity, and its situation between the *pectoralis major* and *minor* muscles. For several days our patient seemed to be doing well; the headache was relieved; the fever greatly abated; the swelling and inflammation much diminished; and the cavity apparently filling up gra-

dually, in short, every thing promised a speedy cure. About this time, however, he was attacked with irregular shiverings, an increase of the inflammation, and swelling of the parts, with a diminution of the purulent discharge, followed by hectic fever and emaciation. On examining the breast, it was ascertained that the matter had not had a free exit, and that deep-seated collections were situated in different parts, all of which it was found necessary to open in the course of the cure. In about three months from the commencement of the attack, the wounds were perfectly healed up, but the arm, from the previous inflammation and position, was so stiff, that the elbow could not be raised more than four inches from the body. However, by regular friction, motion, and the use of the cold and vapour baths, he has at length obtained the complete use of it.

From the great similarity between the above case and that of Mr Cummings, it was conceived that it might have been produced by a puncture or scratch in some part of the body; however, after the most minute inquiry and examination, nothing of the kind could be discovered.

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## SECTION II.

### GENERAL ACCOUNT OF DIFFUSE INFLAMMATION OF THE CELLULAR SUBSTANCE.

#### *Causes.*

THIS disease arises from a great variety of causes, some of which produce it more frequently than others, some in a higher degree, and some with less complication.

1. *Venesection.*—The cases of Hugh Snell No. 1., and Ann Robertson No. 2., are most unequivocal examples of venesection producing diffuse inflammation of the cellular tissue, in its most aggravated form, without any complication of venous inflammation, and with very little affection of the skin. The disease of the arm in M. Dogherty No. 3., E. Harper No. 4., J. Robertson No. 5., and ——— Stewart No. 6., was also the consequence of venesection ; but it is doubtful whether it was excited in the fatal case of Mrs Craig, by the venesection performed before her admission, or by a sprain in harvest work.

Many other slight, and some severe cases occurred in our Hospital, but these examples are sufficient to illustrate the various modifications of the

disease from this cause. I may, however, mention, than an eminent architect, to whom Edinburgh owes part of its magnificence, died lately, in consequence, it is said, of an affection of his arm, after having been bled in the country.

In the records of medicine, cases are to be found which I am disposed to refer to this disease, although there are no dissections to establish the fact, and a different view has generally been taken of their pathology; being, according to the prevailing opinion of the day, ascribed to a flux of humours, the prick of a nerve or tendon, or the inflammation of a fascia, vein, or lymphatic.

It is probably alluded to in the following passage of Ambrose Paré \*. “ For, the late and sad memory of Mrs Courtin, dwelling in the street of the Holy Cross, was in our minds, who, of a vein not well opened in her arm, fell into a gangræne, and total mortification of that whole part, of which she died.”—P. 402.

Hildanus has two cases which have much analogy with this disease. A young nobleman of Bern having been bled, was suddenly seized with acute pain, extending from the wound in the median vein over all the arm. In a few days it swelled, “ *a venæsectione ad humerum usque mirum in modum.*” The swelling soon subsided, except a tumor, not pulsat-

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\* The works of that famous chirurgeon Ambrose Parey, translated out of Latin, and compared with the French by Th. Johnson. Folio. London, 1634, Lib. x. Cap. 38.

ing, about the size of a fist, at the wound. When this burst by the use of emollients, it discharged very fetid pus, mixed with serum and blood. Alarming hæmorrhagy occurred every two or three days, followed by gangrene. The arm was amputated successfully near the shoulder, and the state of the parts is thus described: “ Ex interna enim parte brachii, ubi vena, quam Basilicam appellant, descendit, *ductus*, cum in parte brachii amputata, tum etiam in ipso trunco, quam bellè observari potuit. Per ductum enim hunc pus foetidum ex corpore tam copiosè defluebat, ut post amputationem brachii, cauterio actuali putredinem illam castigare necesse mihi esset \* ;” p. 343. Cent. iv. Obs. 70.—The pus evidently did not flow from the vein, but from a sinus.

The existence of diffuse inflammation is also probable in the other case related by Hildanus. A lady of Lausanne was bled in the median vein. The arm swelled prodigiously. Maturants were applied, and the abscess at last burst where the vein was opened. A very large quantity of pus was discharged, and continued to flow for two months, but she at last recovered\*.

Dionis, when speaking of the occasional bad consequences of venesection, evidently alludes to this disease, when he says, “ In this case, the next day, we find the arm tumified, full of pains, and swelling,

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\* Guilhelmi Fabricii Hildani Opera quæ extant omnia. Folio. Francofurti ad Moenum, 1646.

as it were, in our sight, and it will grow to an extraordinary bulk, if we do not endeavour to divert the torrent, by plentifully bleeding the other arm, by cordials internally administered, and the application of proper remedies to stop the course of these humours, to resolve them, and defend the arm from those in which it is involved. These humours are sometimes so outrageous, that I have seen them gangrene the second, and the patient die the third, day\*.”

Dionis contends, that it does not proceed from pricking a nerve or tendon, as had been alleged, but from a flux of humours to the part in cacochymical habits of body.

Mr O'Halloran † has given an excellent description of the disease of which we are treating, under the title of a Species of Gangrene, subsequent to Phlebotomy. He ascribes it to the pricking of the tendon of the biceps in cacochymic habits.

The first case, (Obs. 27.) he saw on the fifth day after V. S. The patient had worked two or three days after being bled. Mr O'Halloran found no sign of a sore where he had been bled, but the arm greatly swelled from the fingers to the shoulder, and

\* A Course of Chirurgical Operations, demonstrated in the Royal Garden at Paris. By M. Dionis. 2d edit. 8vo. London, 1733. Eighth demonstration, p. 379.

† A complete Treatise on Gangrene and Sphacelus, with a new method of Amputation. By Mr O'Halloran, Surgeon. 8vo, London, 1755, chap. viii. p. 90.

a few black spots about the bend of the arm. Two days after the swelling reached the side, though rather lessened in the fore-arm, no phlyctenæ had formed, nor was the discoloration increased; but next day, the ninth, he died. Although the state of the parts was not ascertained by dissection, yet the absolute similarity of the progress of the symptoms to those observed in the cases I have described, leaves no doubt as to their identity.

In his second case (Obs. 28.) the pain commenced the day after the bleeding. On the fifth Mr O'Halloran saw him. The arm was swelled highly, with a reddish streak over the biceps, and reaching up to the shoulder from the bend of the elbow. He could move the joint, nor was the pain great. Three days after, eighth day, the swelling had reached from the arm to the tips of the fingers, and now that side was affected. "The swelling in the hand and fore-arm was quite œdematous and cold, without the least degree of elasticity, nor could any sensibility be perceived in the parts. The length of the arm it was more mixed." At night, the swelling and coldness ascending to the shoulder, with increased oppression, Mr O'Halloran scarified the arm freely, and with complete success.

Dr Le Hérissé \* has related, under the title of Inflammation of the Cephalic Vein, followed by Suppuration, a well-marked, though complicated

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\* Journal de Medecine, &c. par MM. Corvisart, Leroux, et Boyer, tom. xii. p. 417. 8vo. Paris, 1806.



case. The patient was in the hospital for epilepsy. On the 8th October he complained of headache, and was bled in the foot. 10th and 13th, bled from the jugular vein. 16th, bled in the arm. 17th, slight redness and tension near the last puncture. 18th, Some headache continuing, temporal artery opened, and a considerable quantity of blood taken, after which the face and whole skin became colourless and yellowish, with increased debility. Pulse weak and frequent; arm very painful and swelled, from the elbow to the shoulder; redness around the puncture. 19th and 20th, Fever more intense; tongue dry and coated; arm very painful; tension not increased. 21st and 22d, He is constantly in the supine posture; considerable prostration of strength; heat of skin; very frequent small pulse; acute pain in the right side of the thorax, without any external symptoms; respiration a little affected. 23d, Less tension, a little pus had escaped from the lancet-wound; difficulty of breathing increased; pulse weak and very frequent; moribund. Died during the night of the seventh day. On dissection, besides very unequivocal inflammation of the cephalic vein, there was found disseminated in the interstitial cellular tissue of the *pectoralis major* of the same side, a certain quantity of pretty thick greenish pus. In the right cavity of the pleura, there were about 8 or 10 ounces of yellowish opaque serosity, and in the lungs of both sides there were a considerable number of hepatized

portions, varying in size from that of a hazel-nut to a walnut, which were hard, and gorged with a fluid, which, in some of them, was entirely puriform.

Mr Abernethy, in his well-known and valuable essay \*, has enumerated, as the most frequent of the ill-consequences sometimes succeeding to venesection, inflammation of the integuments and subjacent cellular substance, (p. 134); but, it is evident, that under this head he alludes only to those slight cases of inflammation around the puncture called *festering*, which occur very frequently, yield readily to proper treatment, and whose worst termination is in phlegmon. But it appears to me, that, under the heads of inflammation of the absorbing vessels (p. 136.), and inflammation of the fascia of the fore-arm (p. 151), Mr Abernethy has described severe cases of cellular inflammation.

Mr Charles Bell † also, alludes to a slight degree of this affection, when he remarks: “3. Another and more frequent occurrence after bleeding, is a swelling and inflammation of the puncture; an erysipelatous inflammation, spreading all over the arm, and a bad suppuration.”

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\* On the ill consequences sometimes succeeding to venesection. See Surgical Works of John Abernethy, F. R. S. vol. ii. p. 133. 8vo. London, 1811.

† A System of Dissections. By Charles Bell. 3d edit. 12mo. London, 1809. Vol. i. p. 281.

Mr Travers\* adopts the opinion and language of Mr Abernethy: "In the human subject, abscess at the wound, and diffused inflammation of the subcutaneous cellular texture, the lymphatics and their glands, and even the fascia producing œdematous swelling, and tension of the entire limb, are certainly more frequent than the inflammation of the vein, as a consequence of venesection, when the wound has been improperly treated or neglected, and the patient suffered to use his arm without restriction."—Page 258.

2. *The application of a ligature to a vein.*—The case of Mary Macgregor †, No. 7., at the examination of whose body I was present, was a well-marked instance of diffuse cellular inflammation, complicated with slight inflammation of the vein; and I am disposed to ascribe it rather to the ligature applied to the vein, than to the other parts of the operation.

A similar complication seems to have taken place in some instances, where the vena saphena was tied, as in the one published by Mr Oldknow\*. "Large collections of matter formed in the cellular mem-

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\* On Wounds and Ligatures of Veins. See Surgical Essays by Astley Cooper, F. R. S. &c. and Benjamin Travers, F. R. S. &c. Part i. 8vo. London, 1818.

† Disputatio Medica Inauguralis, De Venarum Inflammatione. Auct. Gulielm. Dumbreck. 8vo. Edin. 1822.

‡ Edinburgh Medical and Surgical Journal, vol. v. p. 177. 8vo. Edin. 1809.

brane, along the course of the vein as far as the groin, and the patient died two months after the operation, the fever assuming the form of an intermittent.”

3. *Dissection.*—The cases of Mr Blyth and Mr Young, No. 8. and 9., even if there was no other, are conclusive as to the production of the disease from this cause. But I am convinced, both from the histories published by others, and from the cases which have been communicated to me when engaged in the compilation of this paper, that diffuse inflammation of the cellular tissue is the most frequent form of that severe and often fatal affection, which occurs from the application of the fluids of a dead human body to a wound or abraded surface.

The cases of the much-lamented Professor Dease, of Mr Hutchinson, and Mr Egan, for which the profession is under the highest obligations to Dr Colles\*, are, in my opinion, unequivocal examples of this affection.

Professor Dease had made a demonstration upon a fresh subject, on Saturday, 13th February 1819, at one o'clock. On Sunday morning early he awoke with violent shivering and sickness of stomach, and he complained of acute pain in his left shoulder. Next day a slight fulness was observed above the

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\* Fatal Consequences resulting from Slight Wounds received in Dissection. By A. Colles, M. D. See Dublin Hospital Reports and Communications in Medicine and Surgery, vol. iii. p. 201. 8vo. Dublin 1822.

clavicle along the left side of the neck, which could not bear the slightest pressure. On Tuesday evening a colourless swelling was observed a little behind and below the posterior border of the axilla, which first suggested the true nature of his disease; and Dr Colles found, on examining the thumb the mark of a slight scratch, upon which a vesicle was formed. He was then rather better for some days, but had delirium on Friday morning, and there was a small vesicle on the fore-arm, which remained stationary until his death. On Saturday the entire side, from a very little below the axilla to the hip, was swelled; and the swollen part was observed to be studded pretty thickly with small elevations, which appeared to the eye like vesicles, but were hard to the touch. During this day the delirium was high, and an erysipelatous redness, which commenced on Thursday in the middle of the swelled side, was now brighter, and rapidly extending. On Sunday at noon, the inflammation extended up to the axilla, and on its posterior edge there appeared to be an abscess, but without fluctuation. A swelling was now observed on the anterior part of the right arm, occupying about a hand-breadth of the flexor muscles. A poultice was applied to this tumor, which was punctured at 5 P. M., and discharged about a tea-spoonful of serous fluid, without any relief, and he died at 10 the same evening, being the eighth day from the first accession of the disease. On the day after death, two or three vesicles about half an inch in length, had formed on his back;

the swelling had extended down the thigh; the left arm was swelled, and rather hardened from the elbow nearly up to the shoulder, chiefly along its anterior surface, but there was no redness or vesication on this limb.

It is remarkable that Mr Egan, who had employed himself in dissecting a part of the same subject, had rigors on Sunday evening, followed by febrile paroxysms. On Tuesday, inflammation was observed on the thumb, with pain and erysipelatous redness; the pains passing up the fore-arm. On Friday he complained of tenderness under the border of the pectoral muscle, and an enlarged gland could be felt. On Sunday, an abscess, which had been collecting for some days in the axilla, was now opened, although there was no redness of the skin, pointing or surrounding hardness. The matter discharged was purulent, of an unusually thick consistence, and the cavity proved to be very extensive, passing across from the pectoral to the *latissimus dorsi* muscle. After this he gradually recovered.

The preceding year, Dr Colles had observed a nearly similar affection in one of his pupils, Mr Hutchinson, who had scratched himself while examining a recent body; and in this case, also, the patient complained first of headache, sick stomach, and most acute pain in the right shoulder and axilla, which, on the third day, increased in an extraordinary degree, but confined to the shoulder-joint, with some swelling about the joint and above the clavicle, but without discoloration of the integuments.

The scratch on the thumb was quite free from inflammation; but the cuticle was raised into a small flattened vesicle, which was about half filled with a very white milky fluid. No inflamed lymphatic vessels could be traced along the arm; nor could any enlargement of the glands be discovered, either in the axilla or above the clavicle, although both parts were exquisitely tender. In this state he continued for three or four days, suffering most agonizing pain, and labouring under violent fever, with great dejection of spirits. He at length had some relief from the pain, without a corresponding remission of the fever. In the course of a day or two, however, he first complained of pain along the right side of the thorax, and a diffused erysipelatous redness was observed, commencing at the axilla, which in a day or two more extended as low as the great trochanter. The skin had a doughy feel, and on some places the surface had the appearance of distinct vesicles, but they felt perfectly solid. Nothing like a phlegmon could be discovered; but on the 15th, an incision was made in the hopes of finding some lymph or matter diffused through the cellular substance, but none was discovered. In a few days, however, the symptoms generally subsided, and he recovered slowly, one phlegmon having formed and burst on the inner edge of the biceps, and another over the sixth rib, not far from the spine.

During the present year, three fatal cases have occurred in England. An account of the first has

been published by Mr Travers \*, and of the second by Dr Nelson. The third has just happened at Bath, and Dr Barlow has been so attentive as to send me an account of the case.

Dr Pett of Clapton assisted, at 8 A. M. on Saturday, 28th December 1822, in opening the body of a lady who had died of peritoneal inflammation after child-birth. At 9 the same evening he suddenly complained of uneasiness in the middle finger of the right hand. On minute examination, a superficial wound was discovered. Some caustic, and a drop of strong sulphuric acid applied, produced no sensation. An hour after he was in bed, he was attacked with a severe rigor, which lasted for three hours. The pain spread from the finger along the arm to the axilla, and was agonizing. The night was passed in dreadful and uninterrupted suffering. In the morning his appearance was alarming. The finger was white, and without sensation. At noon, an incision was carried through the wound to the bone, but was not felt by Dr Pett. In the course of the day the arm became swollen, and the superficial absorbents conspicuous from inflammation, and the pain extended from the arm to the axilla and pectoral region. The finger in a few hours became discoloured and gangrenous, as far as the second joint, where suppuration of the soft parts afterwards took place. The countenance was flushed, the eye ferrety; vigilance, great anxiety, short

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\* London Medical and Physical Journal for February 1823, p. 176.



and quick respiration, rapid and voluble speech, and an unnaturally irritable manner, were accompanied by a very moderate acceleration of the pulse, which soon became intermittent, and then irregular. On Tuesday morning (72 hours), the arm had recovered its natural appearance. It was neither swollen nor painful, nor were any absorbent lines visible. A considerable effusion had taken place in the cellular substance of the axilla, and over the pectoral muscle. It was marked by an erythematous blush, was painful, and crepitated on pressure, as in emphysema. The symptoms varied but little, but there was increased difficulty and heaving of respiration, and increased feebleness at each visit. He expressed a sense of confusion, but there was no further evidence of disturbed intellect than the deviation from his characteristic calmness. The fulness at the axillary edge of the pectoral muscle being sensibly increased on Wednesday morning (96 hours), a lancet was pushed deeply into it, but only a bloody serum issued. On Wednesday, about 6 P. M., he died, having survived the injury 105 hours. The body was inspected on Friday, and no recent morbid appearance whatever was discovered *in* the chest or abdomen. The head was not examined, and there is no mention made of the state of the arm, axilla, or thoracic muscles.

Mr J. W. Newby, on the 1st of June, opened the body of a child which died of enteritis, having also, it was said, erysipelas of the abdomen. On the 2d and 3d, he was occupied in his profession,

but complained of great languor. On the evening of the 4th, Dr Nelson saw him. He complained of headache, general pain in the limbs, heat, nausea, and constipated bowels. Pulse frequent, but neither hard nor full. Tongue white. He did not mention having been engaged in dissection, but shewed Dr Nelson a pustule on the back of the left thumb, exactly resembling the small-pox. He had slight pain in the axilla, without tumor, or any appearance of inflamed lymphatics on the arm. He had taken a purgative and diaphoretics, which were continued. On the 5th, he seemed somewhat better, and continued so till the evening of the 6th. The thumb gave very little uneasiness, and the pain in the axilla was much diminished. He had taken some nourishment, and a little wine and water. 8th, Restless night, and complained of a deep-seated pain in the left breast, which assumed a light pink tinge, and the axilla and arm became more uneasy; thumb nearly well. Pulse increased in frequency. Took very little nourishment or medicine during the day, but had an opiate at bedtime. 9th, Some sleep in the early part of the night, but afterwards excessive irritability, with slight delirium. The inflammation of the breast had extended, and was surrounded with a deeper red margin. Pulse 108, more feeble. Tongue dry, and brown. 10th, Very restless night. Though the irritability was considerably lessened by opium, pain of head greater, and that of the left breast much increased, the tumor had extended from the

sternum to the scapula, and from the clavicle to the hypochondrium. Heat of skin much increased. Tongue dry and brown. Pulse 110. Two fetid stools. Very restless during the day. 11th, Arm had swelled during the night, and the tumor on the breast appeared to contain a considerable quantity of effused serum, and was of a brownish-yellow colour. Symptoms as yesterday. 12th, Restless night; all the symptoms aggravated, and he died about 12\*.

CASE XXXI.—*From Dissection; Fatal.* Communicated by Dr BARLOW of Bath.

Mr Rainer, a pupil of one of our hospitals, assisted in the examination of a man, who died under peculiar circumstances. His only office was squeezing the sponges. He had no wound, but the cuticle had been slightly abraded from a small pimple on one of his fingers. Next day, the hand felt stiff and painful. Poisonous matter had been evidently absorbed, and inflammation of the lymphatics had commenced. He was bled and purged, and next day kept his bed, the hand being enveloped in a poultice. Inflammation continued to extend along the course of the lymphatics, and even pervaded the cellular substance, as evinced by a general tumefaction of the limb; and the fever increased, accompanied by great constitutional irritability, and con-

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\* London Medical and Physical Journal for August 1823, p. 177.

siderable agitation of mind. The ordinary febrifuge treatment was employed, and, as debility increased, bark was resorted to, and wine administered, apparently with advantage. The limb, however, continued to swell, and at length superficial sphacelus became apparent. On the eighth day, some matter appearing to issue from a small opening near the elbow, an incision was made, from which pus flowed freely. The existence of deep-seated suppuration being thus manifested, another free incision was made, from which also matter flowed copiously. The relief, however, was ineffectual, for he sunk rapidly, and died the following night.

While I was preparing these pages for the press, another medical practitioner in this city has been cut off, by a disease which, from the account I have received of its progress, I suspect to have been of this nature. At least he was first seized with sudden pain of the right shoulder, extending over the region of the deltoid muscle. Next day the pain was more intense, and was accompanied with swelling and redness of the shoulder, and the system was already affected with violent and inordinate fever. On the 4th day, the pain in the shoulder was somewhat relieved by the application of a hemlock poultice; but he continued to complain when the part was pressed in moving him in bed. On the 6th day he complained of pain near the crest of the ilium, which was relieved by friction and warmth; but he sunk exhausted on the morning of the 8th

day. About a week before the commencement of his disease, he had opened a body, although he had a sore upon one of the fingers of his right hand, and during his illness a flattened pustule was observed at the part.

The majority of cases have occurred in the examination of bodies to ascertain the cause of death, and when the body had not been interred; and Dr Colles even thinks, and perhaps correctly, that putrefaction rather gives protection to the anatomist, (p. 219.) All the cases which I have observed, or of which I have had accurate reports, except that of Mr Whitelaw and No. 17., occurred after the examination of recent bodies, before they were interred.

It must, however, be admitted, that some bodies are more apt than others to excite the disease; or at least, in several instances, two, and even three, individuals have been affected from the same body. Thus, one body communicated the disease to Professor Dease and Mr Egan; another to Mr Hercy and Dr Hennen *jun.*, and in a slight degree to Dr Dumbreck; another to Mr Young and Mr Blyth; and another to Mr Cumming and Mrs Edie; but the diseases of which the persons died, from whose bodies the infection was received, were neither similar, nor in general malignant. In the examples mentioned, the first was a case of chronic pulmonary affection; the second of dropsy; the third of hydrothorax; and the fourth of puerperal fever. Dr

Dewar was infected by the body of a person who had died of enteritis; Dr Pett from a case of puerperal fever; Mr Newby from one of enteritis; and Mr Burton from one of aneurism. About twelve years ago, Dr Kelly, Dr Anderson, and Mr C. Cheyne of Leith, were all affected in various degrees, after having been engaged in the examination of a woman on whom the Cæsarian section had been performed.

A similar affection occasionally proceeds from the dissection of the carcasses of domestic or even wild animals, both healthy and diseased; or at least butchers and cooks are subject to *paronychia gravis*, approaching to this disease, which they sometimes ascribe to punctures received while skinning or cutting up animals. The fatal case No. 21. arose from a prick with a flesh-hook, and No. 20. was excited by a prick with a sharp bone, but it may be doubted whether, in these cases, the application of animal matters to the injury contributed to the production of the disease, although the disease has rarely been observed to arise from a puncture with a clean instrument, except perhaps when a vein has been opened.

M. Morand has related some very curious observations, which are perhaps referable to this disease. Two butchers killed each an ox, for the use of the *Hotel Royale des Invalides*, the flesh of which was eaten with impunity, and without remark. The one butcher was next day seized with erysipelas of the face, terminating in gangrene of the cheeks; and on the

20th day, had acute pain in the left thigh, with swelling on the inside; and on the following day, a similar affection of the right thigh, which suppurated kindly. But the other butcher, who was not taken ill till the second day, was seized with great swelling in both sides of the lower jaw, violent fever and headache; and notwithstanding active treatment, the swelling extended to the neck and cheek, to the extent of threatening suffocation. “*La peau de toutes ces parties tendues comme un ballon, parut prise d’un emphyseme luisant, porté au dernier degré de tension.*” On the evening of the 5th day, it was still more excessive, and he had frightful stertor. On the 9th, he began to recover, and the disease terminated without any discharge, except from the application of blisters, and the actual cautery. M. Morand subjoins a fact, on the authority of the celebrated Du Hamel, which is still more singular. A large ox, unable to travel, was killed and cut up by a butcher, who having put the knife for a short time between his teeth, was soon after seized with swelling of his tongue, and a closing of the chest, with difficulty of breathing. His body became covered with black pustules, and he died on the fourth day of universal gangrene. An innkeeper pricked his hand with a bone of the same ox. A livid tumor rose on the part; the arm sphacelated, and he died in seven days. Some of the blood fell upon his wife’s hand, which became inflamed, very tense, and a tumor rose which was cured with difficulty. Some drops also fell upon the cheek of the

maid-servant, which was succeeded by great inflammation, and considerable swelling, terminating in a black tumor\*.

The disease, called by the French *Pustule maligne*, which has been so well described by MM. Enaux and Chaussier †, seems to be analogous to the affection of which we are now considering. It is always acquired from a diseased animal or its carcase. The exciting cause is supposed by these observers to act first upon the *rete mucosum*, producing a vesicle; in the second stage, a tubercle arises in the *cutis vera*; in the third stage, we are told "it gradually penetrates into the cellular membrane." Then its progress becomes rapid, violent, and alarming. "There occurs, at the same time, a considerable swelling, which often extends to a very great distance, but always having a peculiar character, which it is important to comprehend exactly. It is neither inflammatory nor œdematous, but is more allied to meteorismus and erysipelas." "All the fibres of the swollen part seem in a state of spasmodic rigidity. The cellular tissue appears as if distended with air and viscid humours; the surface of the skin is shining; the swelling is elastic and resisting; and the patient, after having felt

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\* Histoire d'une Maladie très singuliere arrivée à deux Bouchers de l'Hôtel Royale des Invalides; par M. Morand. Histoire de l'Academie Royale des Sciences, année 1766.

† Methode de traiter les Morsures des Animaux enragés, et de la Vipere, suivie d'un précis sur la Pustule maligne. 8vo. Dijon, 1785.



a burning heat and throbbing pain, has only a sense of torpor, tightness, and weight in the part. Thus, the primary tumor seems a focus of infection, which spreads gradually, and extends in all directions; the centre is entirely sphacelous, while the surrounding parts seem sound, although already in a state approaching to mortification; and while the skin forms a superficial crust, the mortification glides secretly in the cellular tissue, and destroys every thing it meets in its way." p. 189.

In a very recent number of a German periodical publication\*, there is a short, and not very satisfactory, account of the frequent occurrence of anthrax in the district of Merseburgh toward the end of 1822, and no fewer than ten individuals were known to have died of it. It was ascertained that several of the patients had been occupied in skinning sheep and cattle which had died of sickness in the blood (*Blutseuche*); and I strongly suspect that carbuncle, when it proves fatal, changes its character from being a circumscribed to that of a spreading inflammation, as is evidently the case in the *pustule maligne*.

4. *Inoculation by Morbid Secretions of Living Animals.*—The *pustule maligne* has been often observed to arise from the application of the morbid secretions of living animals to the skin, of which

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\* Rust's Magazin für die gesammte Heilkunde, xiv. B. 1. H. p. 100. 8vo. Berlin, 1823.

instances are specified by MM. Enaux and Chausier. A man contracted it from having introduced his hand into the rectum of an infected cow; a woman from thrusting medicines down the throat of another; farriers from wounding themselves when dressing the carbunculous sores of animals. M. Thomassin even quotes an instance where this disease was communicated from a man to his wife in consequence of her dressing his sores. Although Mr A., whose case is recorded in this volume, p. 439., died of inflamed vein, it is worthy of remark, that he was, according to his own account, infected from an open carbuncle on the back of a man who is still alive and well.

No other instance of diffuse cellular inflammation occurs to me from human morbid secretions, unless we consider as such the symptomatic acute anasarca consequent upon scarlatina, and the extensive critical abscesses which sometimes occur in various contagious diseases, and perhaps some varieties of hospital gangrene; but on this last I cannot speak from observation.

5. *Bite of a Venomous Serpent.*—Without meaning to assert that the symptoms observed in persons bitten by poisonous animals are chiefly to be attributed to diffuse inflammation of the cellular membrane, there is no doubt of its occurrence in those cases where the individual has survived long enough for reaction to take place; and I think that every one must be sensible of the striking si-

milarity of the symptoms arising from injuries in dissection, with those so well described by Sir E. Home\*, as having occurred in a man bitten by a rattlesnake in London.

The state of the parts, ascertained by dissection, shewed how extensively the cellular tissue was affected. With the exception of the arm which had been bitten, the body had the natural appearance. The skin was clear and white, and the muscles contracted. The wounds made by the fangs at the base of the thumb were healed, but a puncture made by a lancet was still open. The back of the hand for an inch and a half around the bite in every direction, and the whole of the palm, were in a natural state, except that there was a small quantity of extravasated blood in the cellular membrane. An abscess had formed on the outside of the arm, elbow, and fore-arm, which, when laid open, was nearly six inches in length. Around this the skin was in a state of mortification more than half way up the arm and down the fore-arm, on the outside. Every where else in the arm and fore-arm, from the axilla downwards, the skin was separated from the muscles, and between these parts there was a dark coloured fluid with an offensive smell, and sloughs of cellular membrane resembling wet tow, floating in it. The muscles had their natural appearance every where, except on the surface which was next the abscess.

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\* Philosophical Transactions of the Royal Society of London for 1810, p. 75. 4to. London, 1810.

Beyond the limits of the abscess, blood was extravasated in the cellular membrane; and this appearance was observable on the right side of the back as far as the loins, and on the right side of the chest over the *serratus major anticus* muscle. p. 82.

Similar appearances were induced in an inconceivably short space of time, when a small animal was bitten by a vigorous snake. Sir E. Home caused a rat to be bitten by a poisonous snake in St Lucia. It died in a minute after the bite. The wounds made by the fangs were marked by two specks of blood immediately below the shoulder-blade. On dividing the skin with a scalpel, the cellular membrane under it was found entirely destroyed; the muscles were detached from the ribs, and from a small portion of the scapula. The parts immediately surrounding the bite were exceedingly inflamed. p. 86.—In a second rat, which survived six hours, the same appearances were observed, but in a less degree.

The poison of some of the East Indian snakes seems to act more particularly on the nervous system, producing scarcely any local symptoms except pain\*. Dr P. Russel has, however, in his splen-

\* On the Cure of Persons bitten by Snakes. By John Williams, Esq. Asiatic Researches, vol. ii. p. 323. 8vo. London. 1801.

A Case of the Bite of a Poisonous Snake, successfully treated. By John Macrae, Esq. Asiatic Researches, vol. xi. p. 309. 8vo. London 1812.

An Account of Indian Serpents, collected on the coast of Coromandel. By Patrick Russel, M. D. Folio. London 1796.

did work, related the case of a Gentoo snake-catcher, who, in attempting to catch a Cobra di Capello, was bitten on the hand about sunset. “ He felt instantly a sharp pain in the part bitten, which soon spread on the palm, and upwards on the arm. He was sensible, also, of sickness at the stomach, but did not vomit. In less than an hour, the hand and wrist were considerably swelled, the pain extended nearer the shoulder; he was sensible of a confusion in his head, and disposition to dose.” From this time he himself was ignorant for some hours of what passed, but he was restless,—lay moaning and dozing,—startings were observed about his throat,—his breathing became laborious,—he could not speak articulately,—and seemed not to perceive objects though his eyes were open. Between one and two in the morning he had recovered his senses, and in the morning Dr Russel found the hand and arm monstrously swelled; the man had perfectly recovered his senses, and had no fever, he complained only of confusion in the head, of languor, and of pain in the arm. The parts above the punctures mortified first, the gangrene then spread over the back and palm of the hand, and part of the wrist, laying the tendons bare, and forming an ulcer of considerable extent, which, however, healed favourably. He recovered his health in eight or ten days, but it was several months before he regained the use of his hand. p. 82.

In another case, published by Sir E. Home, a sepoy, bit on the back of the hand by a Cobra di

Capello on 15th October, suffered from pain and swelling of the arm, with hardness, and stiffness, and tumor in the axilla, the appearance and bursting of a blister on the back of the hand on the 19th, and of a deeper seated abscess in the same situation on the 20th. He was convalescent on the 22d, and the recovery was gradual, with the loss of the use of the forefinger, which remained permanently extended.

The description of the effects of the bite of the viper by MM. Enaux and Chaussier, is as characteristic of diffuse inflammation of the cellular tissue, as it can be without dissection. It always commences by local symptoms : “ Le blessé éprouve d’abord, dans l’endroit de la morsure, une douleur vive et cuisante, qui, comme un trait de feu, glisse, se repand dans toute le membre, et même jusqu’aux organes internes ; l’engorgement, la tension surviennent d’un pas rapide, et sont bientôt portés au plus haut degré.” General symptoms supervene, “ Enfin, après un certain temps, la partie mordue s’appesantit, s’engourdit, se couvre de larges taches noires, formées par la rupture des petits vaisseaux sanguins ; quelquefois il s’établit à l’endroit de la morsure, un suintement séreux ; d’autrefois il s’y forme un point gangréneux.” p. 109.

6. *Acrid matters directly applied to the Cellular Substance.*—If Sir E. Home were right in his recollections of the effects of the application of white arsenic on the muscles of a dog’s thigh, when he

compares to them those induced by the bite of a poisonous snake (p. 86.), this would afford an instance of this disease excited by the direct application of an acrid substance to the part; but inflammation of the cellular substance did not take place in any of the many experiments in which I introduced small doses of the solution of white oxide of arsenic into the subcutaneous cellular substance of cats and rabbits, although these proved speedily fatal, by their general action on the system.

It appears, however, from the numerous experiments of Orfila, that this species of inflammation may be readily brought on by the direct application of those poisons which kill in consequence of their acrimony, such as Bryony root, Elaterium, Colocynth, Gamboge, Spurge-Flax, &c. \*

The following case, for which I am indebted to the liberality of my friend Dr Spens, is a remarkable instance of gangrenous inflammation, which followed the application of a very gentle stimulating plaster, often employed with great benefit in such cases. The case occurred when erysipelas was very prevalent.

#### CASE XXXII.

John Murray, æt. 30., was admitted into the Hospital 15th September 1821, on account of acute ge-

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\* Toxicologie Generale, 2 Tomes 8vo. Paris, 1814.

neral rheumatism, with swelling of the left knee. He had experienced repeated attacks of this disease, but none of so great severity as the present, which commenced a fortnight before admission. He was treated at first with cinchona and anodynes. Leeches were applied to the left knee on the 27th, and next day the pain was almost gone, and he was allowed full diet. The pain and swelling, however, must have returned, as the knee was ordered to be fomented on the 1st October, and leeches were repeated on the 7th. On the 10th an ammoniacal plaster was applied. 11th, Knee considerably relieved. 13th, Knee easy when not moved; but considerable pain in the right elbow-joint. 14th, Had profuse hæmoptysis during the night, and this day felt cold and chilly, and complained of slight pain of head. Pulse 108, rather full; had great thirst, no appetite, and vomited his medicine, which was merely a mixture with sulphuric acid, on account of his tendency to perspire. An inflammatory blush also occupied the anterior surface of the left thigh. The ammoniacal plaster was removed from the knee, and a blister put upon the breast, on account of his pectoral complaint. 15th, Breast easier; no hæmoptysis, but had some strangury. The left knee inflamed, and very painful. An emollient cataplasm was applied, and effervescing draughts prescribed. 16th, No vomiting since he took the draughts. 17th, A tolerable night; but there was a pretty extensive livid spot upon the left leg. Pulse feeble. Thirst



rather abated. Got mixture of cinchona with sulphuric acid ; to be seen by the surgeon. 18th, Tolerable night. Tongue white. 19th, Took nothing but a little wine. Hands cold. Pulse not to be felt at the wrist ; he died at 3 P. M. Body not examined.

In the case of Harper, the disease was reproduced in a slighter degree by the application of camphorated oil.

7. *Pricks and Wounds, without the recognized application of any morbid matter.*—By this cause No. 24. was induced ; and I am disposed to think, that the extensive inflammation and suppuration which have frequently resulted from operations to remove ganglions, as well as those which have been ascribed to wounds of tendons and fasciæ, have, in general, been instances of diffuse inflammation of the cellular membrane ; but my limited experience does not allow me to speak more positively on this head. Whether the skin or cellular tissue was the chief seat of the disease in the following case, may admit of doubt.

#### CASE XXXIII.

John Ellis, æt. 50., was brought into the Hospital on 10th September 1821. The left arm, from the fingers to near the shoulder was much swollen, and of a dark and dusky red colour. The fingers

displayed in some parts vesicles, and in others spha-celated spots. The face was pale and collapsed. Breathing short and laborious. Pulse quick and full ; and he complained of intolerable fatigue. The disease had commenced four days before in one of the fingers of his left hand, in consequence of a cut with clean bottle-glass. He was bled, got an anodyne draught, and anodyne fomentations were applied to his arm.

11th, The blood drawn was covered with a yellow coat. He passed a good night, and in the morning some whisky was administered to him. At the visit, the arm was nearly in the same state as when admitted, but he felt easier: had some headache. Pulse 120, rather feeble. Skin cool. Tongue dry and foul. No stool. Laxative pills, and, if necessary, a glyster, were prescribed, with cordials, and anodyne fomentations ; but he died in the course of the day.

The bad consequences which often arise from the scarification of the feet and legs in anasarca, are commonly ascribed to erysipelas; but I think it will appear, upon more accurate examination, that it is the inflammation of the subcutaneous cellular texture, and not that of the skin, which is to be dreaded.

8. *Sprain*.—Dr Pitcairn was so obliging as to give me an opportunity of seeing the young man, Case 25, and of witnessing the examination of the

body, which adds another to the causes, already too numerous, of this intractable disease. The history I have reported, as communicated to me by Dr Pitcairn. The appearances were noted by myself immediately after the dissection, which was performed by Dr Hunter in our presence.

9. *External Violence.*—Whether the spreading gangrene which sometimes follows bruises, severe surgical operations, and other kinds of external injury be strictly referable to this disease, I cannot presume to offer an opinion, as no case of this kind has fallen under my own observation. The case of A. Sutherland, No. 22., may be referred to this head, although the effusion into the cellular tissue was generally serous, or sanious, and was purulent in a few places only. I am also informed, that brewers' servants are often admitted into the London hospitals, in consequences of bruises on the legs, which, especially in summer, are apt to extend up the limb, and sometimes prove fatal from subcutaneous suppuration.

10. *Spontaneously, or from less obvious causes.* Sometimes severe, and often slight cases of this disease, occur without any apparent cause. No. 23, 26, 27, 28, 29, and 30, are examples of this kind; and notes of another well marked instance have lately been communicated to me by Mr Syme, Teacher of Anatomy and Surgery, who was one of the clerks resident in the Hospital when it took place.

CASE XXXIV.—*Fatal.*

Cath. Macdougall, æt. 31., was brought into the Infirmary towards the end of September 1821. The left arm, from the wrist to the shoulder, was swelled and very tense; the surface being covered, for the most part, with very small elevated vesications, of a yellow colour; and over the breast and back there was unequally diffused, dark, dusky redness; the countenance was thin, dark, and particularly anxious. Respiration much hurried. Pulse small and frequent. Tongue dark and furred. The patient complained of pain in the arm, and want of sleep, but seemed mostly oppressed with an insufferable feeling of fatigue and anxiety. She had been taken ill five or six days before admission, and had been gradually getting worse and worse. Cold saturnine lotions were ordered for the inflamed parts, and salts to be taken next morning.

Early next day, it was ascertained that a remarkable change for the worse had taken place. The redness now extended all over the side of the body, as far down as the loin; and large dark coloured *bullæ* had risen from the parts previously inflamed. The respiration was still much hurried, being performed 40 times in a minute. The pulse at the wrist was gone, and a peculiar cadaverous smell could be perceived. (Mr Syme remarks, that this smell was particularly remarkable in his fellow-clerk M

Hercy's case, with which, he thought, Macdougall's strikingly agreed). At noon she was delirious, and at half-past two she died.

To this head I would refer many cases of *Erysipelas Phlegmonodes*, which ought, in my opinion, to be considered as a complication of the cutaneous affection with cellular inflammation, the latter being, on many occasions, the most important disease. In proof of this, I can adduce no higher authority than Dr Thomson, who, speaking of mortification of the cellular membrane, says, "It not unfrequently happens in *Erysipelas Phlegmonodes*, that the cellular texture, which enters between, and connects together, different parts, such as muscles, tendons, nerves, bloodvessels, &c., becomes dead, by which the continuity of their parts is destroyed," p. 512. It is the same affection which Dr Hutchinson treated so successfully by free incisions: "If, however, gangrene should not take place, we have invariably found the disease (*Erysipelas phlegmonodes*) to terminate in effusion or suppuration between the integuments and muscles. These secretions, from being so situated, break down the cellular and vascular connections between those substances, to a greater or less extent, according to the height the disorder has attained; so that immense bags of matter are sometimes formed under the integuments, which may be moved, not only all round the limb, by changing its position, but, as I have often wit-

nessed, from the ankle to the trochanter, and over the *glutei* muscles \*.”

The phenomena of some cases of *Phlegmatia dolens*, of which Mrs Monro's case was an example, appear to me to be explicable only on the supposition of extensive cellular inflammation. This opinion has already been ably maintained by Dr Hull, of Manchester.

“ No doubt remains in my mind, that *the proximate cause consists in an inflammatory affection, producing suddenly a considerable effusion of serum and coagulable lymph from the exhalants into the cellular membrane of the limb ;*” p. 204. †

Dr Hosack, of New-York, considers *Phlegmatia dolens* as “ an inflammatory disease, not only affecting the limb, but the whole system,” and not confined to the lymphatics, but appearing in every part of the affected limb. Agreeably with this opinion he has named it Cruritis ‡. He has given an abstract of the histories of nine cases. The last of these occurred in a male, and terminated fatally.

Professor Casper of Berlin, endeavours to reconcile the opinions of Dr Whyte and of Dr Hull. “ Omnibus enim rite perpensis, morbus noster in

\* Medico-Chirurgical Transactions of London, vol. v. p. 280.

† An Essay on *Phlegmatia dolens*. By John Hull, M. D. 8vo. Manchester 1800.

‡ Observations on Cruritis, or *Phlegmatia dolens*. By David Hosack, M. D. Professor of the Institutes and Practice of Medicine in the University of New-York. 8vo. New-York 1822.

*inflammatione systematis absorbentium, in nonnullis casibus fortasse simul etiam telæ cellulosæ firmatus mihi videtur \* ;*" p. 33.

Indeed, those cases which have been examined after death, shew the same destruction of cellular texture, the same extensive suppuration that we observe in *Erysipelas phlegmonodes*; so that these diseases differ chiefly in their exciting cause, and in the total absence of cutaneous inflammation in most cases of *Phlegmatia dolens*.

This view of the pathology of this disease has been strikingly confirmed by the dissection of a case by Professor Casper, in which the cellular membrane was extensively inflamed, and the bloodvessels, on careful examination, ascertained to be without disease.

“ Postridie ad dissectionem me accinxi. Crurum tumor adhuc idem erat, ubique æqualis; omnes vero ceteræ cadaveris partes valde affectæ inveniebantur. In thorace pulmones fere sani videbantur nonnullis tuberculis in dextro superiore lobo, et vomica sat magna cum bronchiis communicante exceptis; cordis substantia muscularis insigniter flaccida erat. In abdomine aperto hepatis totius incrementum primum notatu dignum observatum est; parenchyma molle erat et pulposum, ita ut digitus facillime idem perforaret. Lata uteri ligamenta insigniter vasculis instructa videbantur, superficies interna

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\* Commentarius de Phlegmatia dolente. Auct. J. L. Casper. 8vo. Halle, 1819.

uteri sordido-viridi colore utebatur, mollis erat, gangrænosa, putrida. Orificium uteri tumidum erat, lividum, gangrænescens, sicuti tota vagina. Crurum cute tunc perscissa, tela mucosa visa est paullo laxior (aufgelockert), ubique liquido subfusco, odore carente, impleta; glandulæ inguinales sanguine solito abundantiores et tumidiores reperiabantur; musculi flaccidissimi erant, et in crure et in aliis partibus. Percaute reteximus vasa magna sanguifera, omnino vero sana visa sunt, et in externa et in interna superficie. Eodem modo nervi crurales ischiadici, &c. denudati sunt: ne minimum quidem extra morem erant, nec tumidi, nec rubefacti. Memorabile tamen est, conditionem morbosam telæ cellulosæ non in solis cruribus, sed etiam per totam pelvim usque ad muscul. psoas, iliac. intern., &c. visam esse. Mortuæ propinqui non permiserunt, ut cerebram medullamque spinalem etiam perscrutaremur," p. 54.

Among the obscure causes of diffuse inflammation may be enumerated contagion and those circumstances which may render it more prevalent at certain times and in certain situations than in others.

There does not appear to me any ground for inferring that it is capable of being propagated by contagion. The only fact which could lead to the suspicion of its being contagious, is that mentioned by Dr Nelson of London, as connected with the case of Mr Newby. "It is worthy of remark, that, during Mr Newby's illness, Mr Jackson, his assistant, had an inflammation of the fauces, of an erysipela-



tous appearance, which terminated in suppuration of the tonsil. His pupil had an attack of low fever, which continued about a week. The housemaid was severely affected with *Cynanche tonsillaris*, which terminated by resolution. The nurse had a slight attack of pyrexia, with pain and stiffness of the neck, on account of which she went home for a day or two, but returning to the house, she was attacked with *Erysipelas phlegmonodes*, which proved fatal. Another woman, who assisted in the room, had also the *Erysipelas phlegmonodes*, but recovered." Dr Nelson concludes his interesting history with asking, "Was the disease which destroyed Mr N. erysipelas, produced by inoculation affecting the cellular substance of the arm, and parts adjoining? Did the five cases which occurred during his disease, and after his death, arise from erysipelalous contagion?" It must be admitted that the coincidence of so many persons being affected, though with different forms of disease, is remarkable. According to the statement in the newspapers, Mr Rainer derived his disease from the body of a man who died in consequence of a needle being thrust to such a depth into his breast, that it could not be extracted. It is not stated of what disease the man actually died. It may have been diffuse inflammation. But I cannot consider these examples as a sufficient proof of contagion; on the contrary, in none of the other fatal cases, was there any evidence of a communication of disease from the persons affected to those in the closest and most

intimate connection with them, nor did the slightest accident occur to myself, or any of the gentlemen by whom any of their bodies were examined. Acute anasarca, a modification of our disease, is a symptom of scarlatina, which is certainly contagious. Other diseases, which sometimes produce it, as *pustule maligne* and carbuncle, are sometimes propagated as if by contagion; and the history already quoted from M. Morand has some resemblance to what was observed in Mr Newby's case.

It is more probable that the disease partakes of the nature of an epidemic. At least severe and fatal cases have been more common of late than at any preceding period. Nor can I ascribe this to the disease having been described under another name, or having escaped observation, for the symptoms are too severe, and the death, when it happens, too sudden, to be overlooked; and yet we find few such cases recorded under any denomination.

The causes why this disease should be more frequent at one period than another, are quite unknown to us. It does not seem to be connected with temperature, or any of the ascertainable atmospheric states; for it has occurred at all seasons of the year. Nor can it be ascribed to any deficiency of wholesome food. It is, however, worthy of remark, that severe and fatal cases occurred when other congenerous, though slighter diseases, were very common. Thus, in Edinburgh, a great disposition to Erysipelas has been observed since 1820, not only in the Hospital, but throughout the city.

Whitlow was prevalent in the country when Case No. 29. happened, and carbuncle and *pustule maligne*, are often epidemic in various parts of the Continent. I have already noticed, from Rust's Magazine, the frequent occurrence of fatal carbuncle in Merseburgh, in autumn 1823. In some patients it was traced to inoculation, but in others the ætiology was more obscure, and hence Dr Rudolph, is disposed to ascribe the frequent appearance of *Anthrax* to a particular epidemic constitution. He observed, that *Furunculus* had been very frequent the preceding summer; and it is known, that this latter form of cutaneous inflammation has repeatedly occurred epidemically; hence he is of opinion, that the subsequent *anthrax* was connected with the preceding *furunculus*.

Our observations are too few to enable us to draw any conclusion as to the influence of situation, and those causes which produce endemic diseases. The greatest number of severe cases which have come to my knowledge, have occurred in Edinburgh, but this was to be expected. The disease has also been observed in Dublin, London, and in Paris, but I have not met with any unequivocal case in the recent medical publications of Germany or Italy.

It is generally supposed to occur more frequently in large cities than in the country, and more frequently in crowded hospitals. This may be true, but in such situations the causes are more frequently applied, and when the disease occurs it is known more generally. Some causes, such as the venom of

serpents, are so powerful, as to excite it in every instance when applied; others also, as the fluids of dead bodies, are generally too powerful to be influenced by situation; but the weaker causes, such as an epidemic state of the atmosphere, may operate more readily in some situations than in others, and the frequency of erysipelas in hospitals, if we do not admit this disease to be contagious, is a proof of it. The occurrence of the death of three nurses in our hospital within about a year, to none of whom any of the more active causes had been applied, is certainly very remarkable, but No. 29. proved fatal in the country; and O'Halloran's cases from venesection took place in the country; No. 6., and the gentleman whose case is alluded to in page 549, were bled in the country; and Dr Nelson, of Denny, informs me, that he has met with several cases of very extensive inflammation in the arm after bleeding, which always terminated in suppuration, when the inflammation was not subdued by the ordinary means. In one case, in particular, the collection of matter was so large, that it encircled the whole arm, from the elbow downwards: but it did not point at any particular part, and for a time was not supposed to be matter by the medical attendants. In Nos. 22, 32, 33, and 34, the disease was at its height before the patients were brought into the Hospital; and Nos. 21, 24, 25, and 30, ran their whole course in various parts of the City.

In animals, a disease somewhat similar is observed,

at least if I understand its pathology, from the very brief descriptions we have of it. Thus, the celebrated Ettrick Shepherd, speaking of the different kinds of Braxy, or inflammation, which are so destructive in store-farms, calls one kind *bowel sickness*, and another, *sickness in the flesh and blood*, and says, that the difference is only discernible on opening the carcase. “ In one, the stomach and intestines only are principally infected, while a small part of the inflammation only is communicated to the flesh. In the other, the fleshy parts are all swollen and corrupted, while a small proportion only of the inflammation is communicated to the stomach and bowels;” p. 19. In another place he says, “ Stragglers will die thus infected, while hogs are dying fast of the former case in the same flock; and all the old sheep which die, as well as the hogs which fall in May, are carried off by this species;” but, upon the whole, not one to ten which die of the former. He likewise tells us, that “ it is the same trouble with that which prevails amongst the young cattle in the west of Scotland, and is denominated the *Black Spauld*,” p. 25.; and I have added, in a MS. note to my copy of Mr Hogg’s Essay, but I do not remember my authority, “ Suspected to be the *Garget* of the English, and to arise from external injury, causing inflammation and mortification.”

Upon the subject of the *Predisposing Causes* I have very little to offer. The humoral pathologists

had no difficulty in this particular. Thus, Dionis says, that it “ happens to cacochymical persons, surcharged with humours, which are always ready to throw themselves into any part.”

O'Halloran uses nearly the same language, “ In fact, in cacochymic habits of body, when the humours are ready to fall upon any part, *quâ data porta ruunt*, if a hurt happens, suppose by pricking a tendon in bleeding, for want of sufficient elasticity of the parts, or a proper sensibility in the *genus nervosum*, or both,” &c.

In modern times we use the expressions, bad habit of body, serofulous diathesis, worn out constitution, and general debility, without having much more precise notions of their import.

As a matter of fact, connected with this subject, it is worthy of notice, that the two first patients whom I lost by mortified arm, Snell and Ralston, were both affected with *Diabetes mellitus*, and both of what is called a serofulous constitution. It is also said that some persons are more liable than others to have their hands affected by being engaged in dissection; some cannot handle the viscera of a recent body with impunity, although their skin be perfectly entire, while others have often pricked and cut themselves without any bad consequence. Leech-bites always fester on some skins, and there are others which can scarcely be affected by a sinapism. But the facts are much too few to enable us to hazard any opinion concerning the nature of these idiosyncrasies. Hundreds of persons, of every recognized variety of

natural constitution, and in almost every variety of disease, including typhus and erysipelas, are bled, for one whose life is endangered by the affection of which we are treating, and what is a stronger argument against the influence of constitution is, that most persons who at last suffer from venesection have been bled before, and in many cases shortly before, without being affected; and in very many cases, even those in which the disease has been excited by venesection, a vein has often been opened in the other arm as a remedy, and in no instance has this second wound given any trouble; and leech-bites and blisters heal kindly even on the affected part.

### *Symptoms of the Disease.*

The progress of the disease, especially in its commencement, is different according to the causes by which it is excited. In a few cases, the disease commences by constitutional symptoms, such as commonly indicate the invasion of typhous fever, or the appearance of an exanthematous eruption. After these have continued a day or two, intense pain, with diffuse swelling, and more or less redness, occur in some part of the body, most commonly in the hand or arm.

In Cases No. 25. to 30. inclusive, and 34., in which there was no local cause ascertained, the disease, after preceding fever, commenced directly in the part

affected with diffuse inflammation, which in No. 29. and 34. was the hand and whole arm, but in all the others the axilla, shoulder and breast.

*Primary Affection.*

In the majority of cases, the constitutional affection is preceded by a local disease. This is excited by a variety of causes acting on the part. In some cases the disease commences in the part, and extends from this gradually and regularly towards the trunk of the body, or also in the opposite direction, without leaving any interval apparently sound. The progress of this variety of the disease is very different, being in some cases confined to the limb, or part of the limb, to which the cause is applied, but in others proceeding rapidly to the trunk, and terminating fatally. This is the common form of the disease from punctures, mechanical injuries, and chemical irritants; it also occurs from dissection, though rarely in cases which prove fatal. Nos. 10, 15, 16, 17, 18, 19, 20, 22, and 24, may be considered as examples of this variety, and perhaps Mr Rainer's should also be included.

In a few of the cases induced by venesection, the lancet-wound seems to heal as readily as usual. In some it remains permanently united, but in others it opens again, or at least the wound of the skin gives vent to the discharge of some purulent matter. More commonly union does not take place. The lips of the incision remain swol-



len, a little red and everted. Some ichorous or purulent discharge appears, and the local disease extends continuously from the wound.—Snell was bled on the 8th December; the local affection was first noticed on the 12th; and on the 14th the swelling extended over the whole arm.—Ralston was bled on the 24th of May; the wound was complained of on the 26th, and, at the same time, the system was suddenly affected in the highest degree, as if it had been poisoned. The swelling extended gradually, and reached the shoulder on the 28th.—Harper was bled on the 18th; the first complaint was made on the 21st; and on the 23d the swelling reached the axilla. Mrs Craig was bled on the 1st September, and complained on the 3d. Jane Robertson was bled on the 17th, and did not make any complaint till the 24th.

In the most alarming variety, the affection follows the usual progress of inoculated diseases. First, a pustule or vesicle takes place at the part to which the poison is applied; then there is high constitutional disturbance, corresponding to the eruptive fever of exanthematous diseases, followed by severe diffuse inflammation in some part of the cellular tissue, rapidly extending in all directions, but not continuous with the primary local pustule, which often gives little uneasiness, and generally heals very quickly.

In these cases, the manner in which the affection is propagated from the local injury on the fingers to the part which is the principal seat of the secondary

disease is doubtful. The common opinion is, that inflammation is excited in the lymphatics of the part by the direct application of the cause, and that the inflammation is propagated along them to the glands in the axilla. By others it may be supposed that the same process takes place along the veins. But, besides, that on dissection no inflammation, or effect of inflammation, has ever been detected in either lymphatics or veins, in cases free from complication, the phenomena of the disease observed during the life of the patient, do not support the idea, that any order of vessels propagates the disease by actually undergoing the process of inflammation.

When the disease proceeds from inoculation, the constitution is very soon affected ; and in most cases violently. Symptoms of constitutional irritation appeared in Professor Dease in about twelve or fifteen hours ; and in the greater number they occurred during the first or second days. Mrs Edie had no fever till the fourth day ; and, if I am right in my conjecture concerning the nature of the case alluded to in page 560, the poison remained latent about a week.

Now, this great and rapid disturbance of the system is excessive when compared to the existing degree of the local affection, hitherto of little extent and severity, and incompatible with a morbid action propagated along the tissue of any order of vessels. There was commonly very little affection of the fore-arm, or arm, and there was rarely any

obvious direct connection between the injury and the inflammation of the axilla and shoulder, so that the connection between the wound and the disease was doubted, and in some of the cases it was altogether overlooked, or was denied. Mr Hutchinson's arm was never affected. There were no inflamed lymphatics, or enlargement of the glands. In Professor Dease no affection of the arm could be traced. In Mr Egan the pain passed from the wounded thumb along the back of the fore-arm, without any other symptoms of its being affected. In Mr Blyth and Mr Young I ascertained that there was no affection of the arm, or fore-arm, so that we were at first doubtful whether the dissection was in any way connected with their illness. In Mr Hercy the secondary local affection began about the elbow joint. No hardness was observed in the course of the lymphatics in Dr Dewar's arm. In Mr Cumming the arm exhibited no marks of inflammation, but there was an inflamed gland above the inner condyle of the humerus. There was some swelling and tenderness between the elbow and shoulder in Mrs Hodge. In Mr Newby there was no appearance of inflamed lymphatics in the arm. In Dr Pett and Mr Rainer, although fatal cases, there was more evident connection between the primary injury and the secondary inflammation. But it may be doubted whether the peculiarities of these cases did not arise from the treatment.

A very slight cut or scratch, or abrasion of the

cuticle, is sufficient to admit the poison into the system. In some cases, as in that of Mr Cumming, no injury could be detected, and in many, the person inoculated merely touched the infecting matter. In Mr Hutchinson's case the scratch was quite free from inflammation, and the cuticle raised into a small flattened vesicle, about half filled with a very white milky fluid. Professor Dease was not conscious of having injured himself; but on the fourth day a vesicle, filled with a fluid of a milky whiteness and consistence, was discovered. In Mr Egan, on the third day, there was inflammation of the thumb, but no vesicle or pustule seems to have risen. In Mr Blyth and Mr Young the scratches gave some pain in a few hours after the dissection, but were almost healed by the time the disease began; and in the latter no remains of the primary injury could be detected when the body was examined. A pustule was observed on Mr Hercy, but it gave him no uneasiness. Dr Dewar applied caustic to the wound immediately, and seems to have taken no more notice of it. On Mr Cumming's finger a pimple arose the next day, from which oozed a little sero-purulent fluid. The scratch on No. 17. soon healed. Mrs Hodge had little distress from her punctured thumb. In Dr Pett strong caustics were immediately applied to the wound, to which it seemed insensible, but intense pain succeeded. In Mr Newby the pustule on the thumb gave very little uneasiness. Mr Rainer felt the hand stiff and painful next day.

*Secondary Inflammation.*

When the cause of the disease was applied to any part of the hand or arm, the seat of the secondary inflammation was chiefly in the axilla, extending towards the sternum, up along the neck, and downwards along the side, as far as the haunch-bone, and even, in Professor Dease's case, to the thigh of the affected side. In most cases, it was confined to one side; and in Snell in particular, the termination of the diseased state at the mesial line on the sternum was defined. In some cases, however, it passed by proceeding continuously along the affected texture to the opposite side; and in others it was translated from one side to the other, or from one part to another, not by the regular spreading of the inflammation, but by metastasis, as we often see take place in rheumatism, gout, or erysipelas. Thus in Dogherty No. 3., the wrist of the left arm became affected on the 27th day after the disease had commenced in the right, and the left knee was also affected. In Dr Dewar, the disease commenced in the left axilla, and was in a few days afterwards translated to the right fore-arm; and in Mr Cumming the left arm, which was first affected, was relieved, before the disease attacked the right arm. In Professor Casper's case, the *phlegmatia dolens* affected first the one, and then the other thigh.

When the swelling reaches the axilla, whether it advance to it progressively from a lancet-wound in

venesection, or appears at once after dissection, it is always of a very peculiar and characteristic nature. It is diffuse and extensive, without the slightest tendency to point, being only flatly elevated above the neighbouring sound parts, and its limits are rarely defined by a margin, which, however, is sometimes raised. It is smooth and equal, having no central hardness, no *focus* where it is more active. If the glands can be felt enlarged, it is only in a slight degree; and, in general, no cords which can be supposed to proceed from enlarged or thickened lymphatics, veins, or other vessels, can be traced under the surface. But it is the general feeling and sensation which the swollen part gives to the touch, which characterises it, and which depends upon the effusion of fluid generally into the cells of the cellular membrane. It is tense, but soft in a greater or less degree, and when pressed by the finger, does not pit, but gives a sensation between the resisting hardness of phlegmon, the yielding softness of œdema, and the elasticity of emphysema. The epithet of *boggy* applied to it by Mr Lizars, appears to me exceedingly expressive of its nature. Like a quagmire, it conveys the idea of a firm surface, with a spongy, unsound bottom, loaded with fluid. Dr Colles seems to have been struck with the peculiarity of the swelling in Mr Hutchinson's case, which he calls *doughy*. and to have at once recognised its peculiarity in those of Professor Dease and Mr Egan. Dr Kinchela, who had attended Mr Hutchinson, was carried to visit Mr Dease, and

“ on seeing the peculiar swelling along the side of the thorax, instantly pronounced this to be the same disease as Hutchinson’s ;” p. 218. In the same manner, having seen the peculiarity of the swelling in Snell, I recognised it immediately in the cases of Ralston, Mr Blyth, Mr Young, Mrs Craig, and others. Mr Macdonald also remarked it particularly in all the Hospital nurses ; nor has it escaped the notice of others, although variously described. Morand calls it a shining emphysema, in a state of extreme tension, and Enaux and Chaussier give a detailed description of the swelling, which, they correctly say, it is of importance to understand. Although various observers have compared it to emphysema, Mr Travers alone found that it crepitated on pressure, in the case of Dr Pett. But this could not happen unless the cells contained air. Even in Mrs Craig’s case, there was no proper crepitation, and the emphysematous tumors were an effect, not a symptom, of the cellular inflammation. Another striking character of the swelling, is the obscure sense of fluctuation, which has led not only myself, but Sir E. Home and others, to make deep punctures, with the view of giving vent to a supposed collection of fluid, when there was nothing to be discharged.

*Pain.*

The pain in the swollen part, in every instance, was exquisite. In Mr Hutchinson it was his chief

complaint, when there was neither discoloration of the skin nor phlegmon. In Mr Dease, also, the pain preceded any redness, which, when it did occur, was partial. In the cases which I have seen, the pain was always independent of any cutaneous inflammation, and obviously arose from sudden distension of the soft parts beneath, in fact, from effusion into the cellular membrane. In Mr Blyth, Mr Young, and J. B., the pain in the axilla was the first alarming symptom. Dr Pett suffered so much from pain along the arm to the axilla, as to lead him to observe, that he had never before known what pain was. Mr Hercy suffered less from pain than is commonly the case.

*Cutaneous Inflammation.*

In some cases, the secondary inflammation runs its course, and terminates in extensive suppuration, without any redness of the skin being perceptible; and in all true cases of this disease, the cutaneous inflammation is secondary, and the result of the progress of the disease from the cellular tissue to the skin. Thus, in No. 25., the skin of the whole side was generally inflamed, and the cuticle separated; but this was the part to which the disease had last extended, and in which it was least advanced, while the skin of the axilla, and over the pectoral muscles and scapula, where the disease first appeared and had made the greatest progress, was never even



discoloured. The same observation was made in almost all the other cases; and it is also clearly established by Dr Colles. In Mr Hutchinson, during the first and alarming period of the disease, no redness of the skin was seen. It never appeared on the parts most severely affected; but after the disease began to remit, a diffused erysipelatous redness extended itself from the axilla, as low as the great trochanter, corresponding in this respect exactly with the case of Mr Blyth. When Professor Dease suffered the most exquisite pain in his shoulder, there was no discoloration of the part, and the redness commenced on his side, in the form of an erysipelatous blush, which afterwards became more extended and stronger.

In the Hospital nurses, there was no affection of the skin, although the existence of most extensive cellular suppuration and gangrene was positively ascertained in one of them by dissection. In Ralston, the skin over the pectoral muscles had rather a livid appearance, and in Mr Newby it had a light pink tinge, with a deep red margin. Vesicles or bullæ seldom appeared until the disease was very far advanced in its progress. They were in general solitary, sometimes remote from the cellular disease, of considerable size, and occasionally filled with bloody serum.

I have never observed the vesicular-like tubercles which were seen in the case of Mr Hutchinson and Professor Dease; but all my observations confirm, in the strongest manner, Dr Colles's observations

(p. 217.) on the slight connection between the affection and any redness of the skin observed, and the total difference of the disease from erysipelas.

As connected with the affection of the skin, I may here observe, that, in several cases, it was so far from being hotter than natural, that it is expressly stated to have been at first unusually cold. This is particularly remarked by Mr O'Halloran, especially in his second case, in which the swelling of the arm and hand is represented as œdematous, cold, and insensible. Sir E. Home was also struck with the coldness of the man's arm bit by the rattlesnake. I have never observed this; but it may be easily explained by the sudden effusion which takes place into the cellular substance, and thus diminishes the connection of the skin with the sources of animal heat.

#### *Fever.*

In most instances, the affection was accompanied with excessive constitutional irritation, and a very high degree of fever, which well deserved the appellation of Typhoid, from the extreme muscular debility and depression of mind which accompanied it. Indeed, on some occasions it was scarcely possible to determine, whether it was a case of this disease, or of typhous fever with peculiar local symptoms.

The symptoms and progress of the fever presented considerable varieties. It sometimes commenced

insidiously, sometimes tumultuously, but, in most of the severe cases, soon reached its height. The chief peculiarities I observed were the supine posture, with depressed shoulders, in which the patient almost always lay, without turning to either side, the absence of coma, and the rare occurrence of continued delirium.

Some of the patients, as Macdougall and Mr Hercy, emitted a peculiar cadaverous smell during life, as observed by Mr Syme; and a fœtid and coloured sweat proved critical in Mr Whitelaw's case.

My notice was strongly attracted by the morbid state of the respiration in several of these cases; and, in fact, there are two very sufficient reasons for it; one of which almost always occurs, and both not unfrequently. When we consider that the inflammation with extreme tenderness most commonly affects the *pectoralis major* and *minor*, *serratus anticus*, and other muscles connected with the ribs, we may be satisfied that their motion must give uneasiness and pain; but when the intercostals themselves are involved in the disease, their action becomes more distressing. The pain in these cases resembles that in an exquisite degree of pleurodyne.

But in some cases the pain is not solely muscular, for the inflammation extending to the pleura, we have superadded the acute pain of the pleuritis. The latter variety was particularly remarkable in Mr Young's case, and the former in Ralston's.

In many of the other cases also, the respiration

was much affected, especially when the disease began in the arm.

#### *Terminations.*

Diffuse cellular inflammation has various terminations, modified by the exciting cause, the nature of the part affected, and the kind of inflammation.

In the very slight cases only, when it arises from an injury, does it terminate in resolution; and indeed, I do not remember having seen one where this took place, after any alarming symptom had occurred. Yet some of the numerous examples, in which, after venesection, the lips of the wound do not adhere by the first intention, and are surrounded by a diffuse colourless, or erythematic swelling, may be referred to this head. We may also consider, as examples of this kind, when a prick or scratch inflames and swells from dissection, without going further. If I am right in considering acute anasarca and phlegmatia dolens as depending upon inflammation of the cellular texture, they present us with frequent instances of its termination by resolution.

The next most favourable termination is abscess. In this case, the effusion of coagulable lymph seems to arrest the extension of the inflammation, by producing accretion and obliteration of the cells, and concentrating, as it were, the inflammatory action within a limited space, converting the diffuse and

spreading inflammation into the fixed and circumscribed; or, as Mr James would probably express it, there comes on, in the progress of the disease, the disposition to limit the inflammation by the effusion of coagulable lymph, which was at first deficient. This termination is very frequent after venesection, when abscesses are formed near the edge of the biceps, or in the fore-arm. The case of Harper is an example of this termination, and many others are to be found in authors; but the abscesses have been generally considered as suppurated lymphatics, whereas they appear to me to be seated in the cellular tissue. It is to this termination, that it has been the object of surgeons at all times to bring the disease, in their attempts to cure it.

Diffuse and extensive suppuration is a more frequent termination of the severe cases, and is observed both in instances which finally recover, and in those which prove fatal.

When the recovery after suppuration and sloughing is complete, the cellular membrane seems to be regenerated; and this is the more probable, as we see it every day formed in these preternatural adhesions which take place between serous surfaces, and in what are called new or false membranes.

In some cases, however, Nature seems to be inadequate to the reproduction, or rather the state of the neighbouring parts necessary for the reproduction has been permanently affected; and we find adhesion of the skin to the subjacent muscles, or deeper seated adhesions remaining, giving rise to

permanent contraction of the limbs, or rigidity of the muscles. In many instances these gradually disappear in a great degree, but in others they are more or less permanent. This seems especially to be the case when the diffuse inflammation of the cellular tissue is complicated with that of the skin.

In Mr O'Halloran's third case (Obs. 29.), three of the toes were lost by mortification, and the whole side became paralytic, as well as the leg and arm, and the use of the arm had not been recovered at the end of eighteen months. In his fourth case (Obs. 30.), both feet separated at the junction of the bones of the tarsus with the metatarsus; but this termination is very rare.

When the inflammation, in consequence of its spreading, affects the cellular tissue, which forms the attached surface of a serous membrane, the whole serous membrane becomes affected, and then the disease sometimes spreads rapidly and independently in this membrane, producing all the common phenomena of inflammation of a serous membrane. This was strikingly exemplified in Mr Young's case, where we found the inflammation spreading over the diaphragm and pleura costalis to the spine and pericardium, with sanguinolent effusion. Inflammation of the pleura, terminating in adhesion, and the formation of a false membrane, had also taken place in Mrs Craig's case; and in that of Mary Ross.

The transition of the disease to the mucous mem-

brane, has not been so distinctly observed, perhaps because they are less intimately connected with that portion of cellular substance which is the ordinary seat of the disease. Yet, I may mention, that during Mr Blyth's convalescence, an aphthous inflammation of the fauces was the most distressing circumstance, and required special treatment.

Even the bone does not escape the ravages of this very extensive disease. We found in Mrs Craig, the ends of several of the ribs carious and denuded of periosteum; but some doubt remained whether it was not the effect of a previous attack of syphilis, until an observation made in the examination of the body of No. 25. has satisfied me on this point; for when Dr Hunter divided the periosteum of the ribs, it immediately retracted and shewed that it had lost its adhesion to the bone by the effusion of a small quantity of serum beneath it, and a probe was easily introduced between the periosteum and bone. Now, had this young man survived as long as Mrs Craig, the ribs might have, in like manner, become carious.

In other cases, also, we have reason to conclude, that the periosteum was affected. The girl Robinson always complained of her excruciating and lasting pain as being seated in the bone; and it was with this belief that I directed incisions to be made through the periosteum, with the hope of giving vent to any confined fluid; and although the operation was not successful at the time, it may have contributed to her ultimate recovery.

Nothing morbid was observed in the state of the nervous system in any case.

The fatal termination of diffuse cellular inflammation takes place at very different periods, either in a very short time during the height of the disease, or after a considerable period has elapsed, in consequence of the sequelæ.

Dr Pett died in about 105 hours ; Dr Dewar on the 7th day ; Professor Dease and Mr Young on the 8th ; Mr Rainer, and case in page 563, on the 9th ; Mr Hercy and Mr Cumming on the 11th, and Mr Newby on the 12th day, after they had been engaged in dissection. Snell and Ralston both died on the 6th day after the symptoms commenced, in consequence of venesection. Of the other speedily fatal cases, Ellis and Murray died on the 6th day ; Sutherland and Macdougall on the 7th or 8th ; Macgregor, Reid, and No. 29. on the 8th ; No. 25. on the 9th ; and Ross on the 15th. Dogherty lived 30 days ; Mrs Monro died hectic in about six weeks ; and Mrs Craig survived three months.

#### *Dissection.*

Although, in the preceding part of this essay, I have been enabled, by the kindness of various friends, to insert in detail the reports of the only series of dissections of the bodies of individuals who have fallen victims to this affection or



its sequelæ; yet I trust it will not be thought a work of supererogation, to attempt to describe them methodically, for the true pathology of the disease can only be derived from a correct knowledge of these appearances. As this disease is progressive, affecting one part first, and then others in succession, we find it after death existing in different parts, in all its stages. Accordingly, in the part most recently affected, which was often the space between the twelfth rib and the os ilium, we find the cellular substance merely œdematous, with increased vascularity; the serum is still fluid and limpid, or tinged with red, and readily flows from the divided tissue. In a more advanced stage, the effused matter is less fluid, often higher coloured, and has not yet acquired the opacity and whiteness of purulent matter. We next find the cellular membrane gorged with a white semi-fluid matter, which does not flow from the incision, but greatly augments its thickness, and separates the particles of fat to an unusual distance from each other. In the subsequent stage, it continues opaque, whitish, or reddish, or greenish, but becomes more fluid, so that now purulent matter flows from the incision. But the pus is still contained in the cells of the tissue; and it is only in the last stage of the disease, and after the tissue is entirely broken down, that we meet with collections of purulent fluid, with sloughy membrane; even then, however, the pus is not contained in a cyst or circumscribed cavity, but is gradually lost in cellular substance in the preceding

stage of the change, without any line of demarcation.

When fluid pus is formed, I have already spoken of it as if it were broken down cellular substance; but it is perhaps rather a secretion, which is in such abundance as to rupture the cells, and break down the cellular membrane, so that the portions thus disjoined from their necessary attachments become dead, or, in common language, sphacelous. In this way we may account for the masses, like skeins of thread, drawn out of Mr Blyth's side; and the sloughs of cellular membrane, described by Sir E. Home as resembling wet tow, and by Mr James as looking like large wads of wet shamoy leather.

Next to the cellular tissue, the *muscular substance* is that which is most constantly affected, although it might be doubted whether the interfibrous cellular texture alone was diseased, or whether the true muscular fibre itself was likewise inflamed. I am disposed to adopt the latter opinion, not only from the very intimate manner in which they are mixed, so that one cannot be conceived to be affected without implicating the other, but also, because, on dissection, we have always found the muscular substance much more tender and easily torn than is natural, and its colour altered. In the case of Mrs Craig in particular, we had the most direct evidence of the ultimate destruction of both layers of the intercostal muscles; and Sir E. Home, in a rat bit by a snake, found the muscles detached from

the ribs, and a small portion of the scapula. In some cases, the colour of the muscular fibre in the affected parts was much paler than usual, as in the body of No. 25., the last I have seen ; and in others it was very much darker, as I recollect particularly in the first, that of Snell.

The cellular membrane is abundantly supplied with *vessels* of every description, and those which belong to the diseased part cannot remain perfectly sound. Indeed, the very formation of serous and purulent fluid, which is an essential character of the disease, is the result of a morbid action of the capillary vessels ; and, accordingly, we find the usual indications of what is called increased action of the vessels. The number of visible red arteries is augmented, and the veins are enlarged and turgid with black blood. These appearances of the vascular system, I consider as primary. Mr John Hunter has described a secondary affection of the veins, which has hitherto escaped my notice. “ I have found,” says he, “ in all violent inflammation of the cellular membrane, whether spontaneous or in consequence of an accident, as in compound fractures, or of surgical operations, as in the removal of an extremity, that the coats of the larger veins passing through the inflamed part, became also considerably inflamed ; and that their inner surfaces take on the adhesive, suppurative, and ulcerative inflammations ; for in such inflammations I have found in many places of the veins, adhesion, in others matter, and

in others ulceration \* ;” (p. 18.) And he adds, that “ it is so common a case, that I have hardly ever seen an instance of suppuration in any part furnished with large veins, where those appearances are not evident after death ;” (p. 19.)

The *lymphatic vessels* must also partake of the general disease, but their state has never been ascertained by dissection. The axillary glands have, however, been often observed enlarged, and imbedded in highly diseased cellular substance ; but although a swelled and tender axillary gland has been very frequently mentioned as one of the first symptoms observed, I have never found them so much diseased as at all to support the idea that their affection was the primary cause of the state of the surrounding parts. In Mr Blyth, swellings of the lymphatic glands of the groin were amongst the last symptoms observed, and did not appear until his convalescence was advanced. In Sutherland, No. 22, a small portion of pus was found in one of the axillary glands.

I must confess that no particular notice was in any of our dissections paid to the state of the *fasciæ*, but at least there was no such change in it any where as to attract our attention. An argument in favour of the insusceptibility of inflammation as a

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\* Observations on the Inflammation of the Veins, by John Hunter, Esq. F. R. S. See Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge. 8vo. London, 1793.

property of tendon, may be derived from Mrs Craig's case, in which the tendinous *septa* between the ribs were left in places where the muscular substance and all other textures had disappeared.

The *skin* is frequently severely affected, but not essentially or primarily. This point of pathology is, I think, indisputably established by the preceding dissections.

### *Diagnosis.*

The diffuse inflammation of the cellular tissue may be and has been confounded with many different diseases; and, indeed, this is not wonderful, for so extensively does the cellular tissue enter into the composition of all our organs, that it is rather difficult even to imagine a case perfectly free from complication. It will be necessary, however, to say a few words on the characters which may serve to distinguish it from those affections with which it has the greatest analogy; and on the varieties of the disease produced by their complication.

*Phlegmon*, when it takes place in the subcutaneous texture, is easily distinguished from diffuse inflammation, by the hardness and circumscribed extent of the tumor in the first stage of the disease,—by its becoming soft and pointing in the centre as it advances,—and by its discharging its whole contents at once, when it bursts. It is more difficult to ascertain the nature of phlegmon, when it is si-

tuated beneath a fascia, as the resistance of the membrane by which it is covered prevents it from pointing, and renders its form flat and diffuse. We may, however, conjecture the existence of deep-seated phlegmon when there is pulsating pain; when the character of the fever is rather inflammatory than typhoid, and when, after the general symptoms subside, the pain and tension remain in a limited space, and after a time a sudden effusion of pus takes place, with instantaneous relief. This seems to occur in many of the cases of sore arm after venesection, as in Harper, and Robinson.

Although phlegmon and diffuse inflammation, are opposed in one essential character, they may be complicated with each other in various ways. They may either exist together in neighbouring portions of the cellular tissue, or the one may be converted into the other. Every case of phlegmon is surrounded by œdema, more or less extensive; but in the immediate vicinity of the phlegmon, this generally disappears as the tumor advances to suppuration, although, at a certain distance from it, the diffuse inflammation may proceed to suppuration and gangrene.

It is not easy to conceive, that phlegmon can be converted into diffuse inflammation, because the nature of its first stage precludes the probability of that change, and it seems to be the nature of phlegmon to concentrate, as it were, upon itself the whole of the increased action; yet we certainly see cases in which an abscess is imbedded in diffuse inflam-

mation, as in the example of Snell, where the abscess previously existing, seemed rather to aggravate than mitigate the fatal disease caused by venesection.

On the other hand, it is not improbable that diffuse inflammation is frequently converted into phlegmon, by the effusion of coagulable lymph in a particular part, and the resolution of the surrounding inflammation by the property already ascribed to phlegmonous inflammation, of concentrating upon itself the morbid action. This conversion is always salutary, and takes place, I believe, whenever we see extensive swelling and general tension succeeded by phlegmon.

It is scarcely necessary to point out the diagnostic characters between diffuse cellular inflammation and *erysipelas*, or rather cutaneous inflammation, when they are pure and unmixed. Acute œdema or anasarca, when attended with pain and fever, and some cases at least of *phlegmatia dolens*, and similar affections, the cases No. 23. and 24. for instance, may be considered as uncomplicated cases of diffuse cellular inflammation; but more frequently, a blush of diffused redness, or red patches, indicate that the skin participates in the disease.

In the same manner, we have instances of inflammation of the skin, both limited and diffuse, with little or no affection of the subjacent cellular tissue. But even in circumscribed pustular and specific inflammations of the skin, we often find the subjacent cellular texture affected with œdema, or

even suppuration. Thus in small-pox, we have œdematous swelling of the whole surface, especially remarkable in the face, neck, hands, and feet, occasionally terminating in abscess. In a case of confluent variola lately under my care, subcutaneous abscesses endangered the life of the patient long after the small-pox had terminated. It is, however, in the diffused inflammations of the skin, that we most frequently find the cellular membrane affected. Scarlatina is but too often followed by anasarca, and in *Erysipelas phlegmonodes*, it is difficult to say whether the skin or cellular texture be the original seat of the disease. Dr Kirkland supposes that two distinct inflammations exist at the same time, erysipelas, affecting the skin, and phlegmon, the cellular membrane, each having its peculiar termination. I am disposed to think, that, in the severe cases, where the pain, fever, and swelling, precede the redness, the disease exists essentially in the cellular membrane, and that the redness and even vesication of the skin are only secondary effects from contiguity of texture. Mr James, on the contrary, seems to consider the cellular as always depending on the cutaneous inflammation, and that the spreading of inflammation in the cellular tissue, is the consequence of the skin being the true seat of the disease in all cases hitherto referred to erysipelas. His words are: "The disposition to spread is very remarkable, and this, probably, is connected with the circumstance, that the skin is primarily affected: for there is much stronger disposition to the adhe-



sive inflammation in the cellular membrane than in the skin. It also seems probable, that the inflammation spreading over the skin, *leads it* in the subjacent cellular membrane." P. 237.

But I hope I have sufficiently established, that inflammation may, and often does, spread in the cellular membrane, where no affection of the skin exists to induce it, and that, on the contrary, the cellular inflammation often leads, to use Mr James's apposite expression, the cutaneous.

*Inflammation of the vein* is recognised, when the vein can be felt lying like a cord under the integuments, red streaks appear in the course of the vein, and the tenderness on pressure is confined to the same line. There is also probably less pain on motion of the limb; and I should not expect the respiration to be so much affected, as the muscles, by which it is performed, are not involved in the disease; and, for the same reason, there should be no fulness of the pectoral, cervical and lateral muscles, and less appearance of erysipelas.

It must, however, be admitted that the diagnosis is often difficult. Thus, the general tumefaction of Mr A.'s arm, and especially its origin from a cause which had hitherto not been known to produce inflamed vein, deceived me, and it was considered to have been an instance of diffuse inflammation, until the examination of the body shewed that the disease was in the vein; but although the vein could not be felt like a cord, still the pain, on pressure, was confined to the situation of the affected vein,

and two red streaks, in the same situation, appeared the day before death.

From the only case of inflamed vein in man, of which Mr Hunter has recorded the particular appearances, we can derive no assistance in establishing a diagnosis\*.

In the history of Mr Broughton's case †, I can discover no diagnostic symptom, and I confess, that I should have considered it as an example of diffuse inflammation. Indeed it probably was an instance in which both systems were affected, the venous chiefly. "There was so much inflammation, adhesion, and induration, in the upper part of the arm, that it was extremely difficult to trace the vessels, and detach them from their connexions." P. 215.

In Mr Travers's first case, p. 211., the only diagnostic signs are the pain extending up the arm in the course of the vein, and the apparent enlargement of the vein.

Mr Oldknow's case ‡ of death from inflamed vena saphena, had pain on the inner side of the knee, in the course of the vein, but there was no external inflammation at that part. "The inflammation went gradually up the vein, which was evident from its peculiar cord-like feel, from giving pain on pressure, until it reached the groin, the inferior part getting well as the superior became bad, so that the

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\* Med. Comment. vol. iii. p. 434.

† Hodgson, p. 512.; Travers, p. 214.

‡ Edin. Med. and Surg. Journ. vol. v. p. 175. Travers, p. 218.

wound was nearly healed before death, the ligatures having separated about the fourteenth day. There was no tumefaction of the cellular membrane, no enlargement of the glands of the groin, no superficial inflammation on the thigh." P. 176.

In Mr Hodgson's first case, the characters are more distinctive, "no pain of limb; he did not complain when it was pressed, nor was it tense or red," p. 556.—"The redness, pain, and tenderness of the thigh, had increased and extended up the limb, in the course of the saphena," p. 557.

In his second case, the pain in the course of the vena saphena was excruciating, p. 560.

Mr Travers's first case, p. 216., of ligature of the saphena was probably complicated with cellular inflammation; and in the second case, (p. 217.), I should suspect that the latter disease was the chief cause of death; but neither case was dissected.

No. 7. of the series of cases in the first part of this paper is a very well marked example of complication venous with cellular inflammation.

The following case, observed by M. Raikem, and inserted in the valuable Notes added by Breschet to his Translation of Mr Hodgson's work, is another variety of this complication, and may serve to illustrate the singular case already quoted from Hildanus.

A lad of 14 or 15, who had been cured of a cutaneous eruption by mercurial inunction, was soon after seized with acute and continued pains in the right lower limb, which became affected with serous

infiltration, and fever supervened. In the middle of March 1809 he was admitted into the Hospital, with all the symptoms of Pinel's continued adynamic fever (typhus); the right thigh and groin presented an œdematous swelling, exceedingly painful, although the surface of these parts had their natural colour and temperature. The left leg was a little infiltrated. No remedy succeeded in relieving his intolerable sufferings. A circumscribed and purulent deposition (*depôt*) took place in the subcutaneous cellular membrane of the anterior and upper part of the chest; and he died on the 4th April. On dissection, the *vena cava ascendens*, and both iliacs, were diseased: "The place of the right iliac was supplied by a kind of ligamentous canal, with thick sides, and a very contracted calibre, which terminated and lost itself in a vast collection of purulent matter in the cellular texture, surrounding the hypogastric and iliac vessels, as well as the external and right surface of the bladder. Notwithstanding the most minute examination, not the smallest vestige of the crural vein could be discovered; the course of that vessel was occupied by a circumscribed streak (*trainée*) of pus, and the suppuration extended to the calf of the leg. The veins of the leg were contracted, and filled by solidified fibrine; and there was no disease in any other part of the veinous system. The subcutaneous cellular substance of the legs contained serosity." Tom. ii. p. 443.

The diagnosis between diffusive cellular inflammation and *inflamed lymphatics* is more difficult.

Unless we admit superficial red streaks, not connected with veins, running along an extremity from the place, where the exciting cause is supposed to have been applied, and swelling of the lymphatic glands, to which they lead, as being conclusive evidence of inflammation of the absorbents, and the absence of these characters as a proof that the lymphatics are not affected, I can point out no other diagnostic signs by which we may distinguish, during life, inflammation of the lymphatics from that of the cellular tissue.

Granting that a morbid poison, applied to a broken surface, may be taken up by the absorbents of the parts, which is strongly combated by Magendie, and admitting that the lymphatic vessels and glands may be in some instances first affected, I am perfectly satisfied, that the surrounding cellular substance soon becomes the real seat of the disease in all cases where there is great tumefaction, distention and pain of the limb, and most certainly, where these symptoms are followed by extensive suppuration; and that in many such cases there is no evidence whatever of the absorbent system being particularly affected, although this be the present opinion of many of the best pathologists both in Britain and in France, since the publication of Mr Abernethy's valuable Essay. It will be expected that I should state distinctly the grounds on which I venture to differ in opinion from so celebrated a pathologist.

In Mr Abernethy's first case of inflammation of

the absorbents, (p. 137.), two swellings appeared after venesection, on a lady's arm, one on the middle of the arm, over the large vessels, and the other on the fore-arm, midway between the elbow and the wrist. The grounds for considering these as inflamed lymphatics are, that "they so exactly resembled those tumors which form round irritated lymphatics, that no doubt could be entertained of their nature;" "no induration of the venous tube could be distinguished;" and Mr Abernethy could plainly feel two indurated absorbents leading to the superior tumor, but none to the lower. The tumors terminated in resolution. In Mr Abernethy's second case (p. 139.), treated by Mr Pott, after bleeding, the orifice festered, the pain and swelling extended to the armpit, where the glands were enlarged; inflammation then attacked the fore-arm, and, on admission to St Bartholomew's, the arm was greatly swollen; two large abscesses had formed, one near the inner edge of the biceps muscle, about the middle of the arm, and the other on the inside of the fore-arm. Mr Pott opened both abscesses, and after they were nearly healed, the parts surrounding them still remained thickened, and also all the integuments on the inside of the arm, and in these thickened integuments, three cord-like substances, evidently, he says, absorbents were to be distinguished, extending from the punctured part to the superior abscess; and again, above this, two were continued even to the axilla. Two other indurated vessels also extended from the punctured part to the inferior ab-

scence, “ their appearance, course, and every other circumstance, clearly shewed them to be indurated absorbents.

In the third case (p. 141.), the lancet-wound festered. Pain extended to the axilla, and one of the glands there was swollen. The integuments about the middle of the arm were elevated by a tumor, which was painful when pressed, and whose base was not circumscribed, but was gradually lost in the surrounding parts.

In abridging Mr Abernethy's cases, I have meant to retain every fact in favour of his opinion, but to me the evidence is quite unsatisfactory. The general and diffuse tumors observed cannot be accounted for on the supposition of the inflammation of a few, nor even of many of the lymphatics; the glands, or rather the cellular substance around the glands, will swell in every case of inflammation, although it be certain that the lymphatic system is not the seat of the disease; and the evidence of cord-like substances felt during life through the integuments, is too vague to be admitted as conclusive against the general resemblance of these cases to others, in which the nature of the disease was ascertained by dissection.

It is but justice to Mr Abernethy to state, that, when he wrote, he does not appear to have met with an instance of death as a consequence of venesection, and therefore had no opportunity of observing the morbid state of the various textures; for there cannot be a doubt, that if he had witnessed the dis-

section of such a case as those of Snell or Ralston, his views would have been different.

Nor is the evidence upon which Mr James admits inflammation of the absorbents more satisfactory. In describing *Erysipelas phlegmonodes*, he says, "It most frequently begins about sores which are nearly healed, or have been recently irritated," (p. 254.) "At first the sore looks red, irritable and dry; a blush is seen around it; streaks move upwards and downwards in the course of the absorbents," (p. 256.) "Abscesses also often form all the way up the thigh, and down the leg and foot, in the course of the inflamed absorbents. The lymphatic glands, too, inflame and suppurate, and seem to check the spreading of the inflammation. In them, its character approaches more to that of phlegmon, and the pus is of a better description than in the leg; (p. 257.) Upon these circumstances, Mr James considers the inflammation of the absorbents to be so prominent a feature in these cases, as to leave it a matter of doubt whether this species of inflammation should be classed with inflammation of the absorbents or with erysipelas.

Magendie discusses the absorption of morbid poisons by the absorbents, and their consequent inflammation, in a very unsatisfactory manner. He seems to deny the absorption, but to admit the inflammation, and concludes by saying, that it is common to find the veins inflamed after puncture, and even at the same time with the lymphatics. He mentions as a striking instance of this, the case of



Professor Lecler, who died “in consequence of the absorption of putrid miasms, which took place by a slight abrasion on one of the fingers of his right hand. The lymphatics and glands of the axilla were inflamed. The glands had a brownish colour, evidently morbid; but the internal membrane of the veins of the right arm presented unequivocal traces of inflammation, and the *lymphatic glands of the whole body* exhibited the same change as those of the right axilla\* ;” (p. 190. t. ii.) But this last fact renders it improbable that the state of the axillary glands arose from the absorption of putrid matter from the abrasion of the finger.

Mr Abernethy, and those who have adopted his opinions, have not altogether overlooked the influence of the cellular membrane in the diseases ascribed by them to inflammation of the lymphatics, although they have, in my opinion, much underrated its importance. Thus, Mr Abernethy admits, that “when the absorbents become inflamed, they quickly communicate this disease to the cellular membrane by which they are surrounded ;” (p. 144.) Mr James also says, “the inflammation runs along these vessels, and being communicated to the surrounding cellular membrane, the skin inflames over them, and the progress is marked by streaks running along the limb with much rapidity, both upwards and downwards ;” (p. 198.) In this place, it is evident that Mr James understands

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\* *Precis Elementaire de Physiologie.* Par F. Magendie. 2 tomes 8vo. Paris, 1817.

a very limited portion of the cellular tissue lying immediately between the inflamed absorbent and the skin ; but he has also included under the title of “inflamed absorbents,” the inflammation which is produced by the absorption of the matter of dead bodies. “There is another variety which certainly differs in some respects, and in which the profession ought to feel a particular interest, but which has not as yet received any distinct notice ;” (p. 199.) “The difference,” he adds, “between this and common inflammation of the absorbents, arises from the peculiar effects of the poison in lowering the nervous energy, both general and local.” (P. 200.)

Mr James has given the title of “*Erysipelas phlegmonodes biliosum*, combined with inflamed absorbents,” to such cases as those described by Mr C. Hutchinson, and considers the peculiar character of this disease to depend much upon the inflamed state of the absorbents ; but the evidence of this is not very conclusive ; while he admits that the subcutaneous cellular membrane suppurates and sloughs extensively, looking like large wads of wet shamoy leather when separated. (P. 256.)

Formerly, many cases were considered as examples of *inflammation of the fascia* ; but their number has been greatly limited, first by Mr Hunter, and then by Mr Abernethy ; and I am disposed to impute almost all that are not decided cases of inflamed vein or lymphatics, to inflamed cellular tissue ; that is, I believe that the disease, in no instance, commences in the dense tendinous mem-

brane, but that, when it is affected, it always spreads by contiguity from the cellular tissue which connects it with the neighbouring organs. Mr Abernethy has, however, retained a few cases as seated in the fascia.

The first of these (p. 152.) occurred to Mr Pott, by whom the distress was ascribed to punctured nerve. It was relieved by an incision through the fascia, which gave vent to much matter collected beneath it. In the other case seen by Mr Abernethy (p. 154.), the disease terminated by resolution. The histories, however, do not seem to furnish any proof that the fascia in either case was inflamed, but rather that there was diffuse inflammation beneath the fascia.

Neither do I consider as more conclusive Mr Colby's case \*, to which Mr Abernethy refers as one of inflamed fascia, but which was supposed by the author to arise from a puncture of the tendon. The affection was very slight, consisting of stiffness of the whole fore-arm, pain, and inability to move it, which disappeared in about three weeks, on the supervention of erysipelas of the face, neck, and arm.

Mr Abernethy also quotes, as an instance of inflamed fascia from puncture in venesection, the first case described by Mr Watson in the same volume, p. 251. It is a very interesting, and in many respects anomalous, case. The chief symptom was contraction of the fore-arm, which was three several times relieved by incisions through part of the fascia.

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\* Medical Communications, vol. ii. p. 18.

Some time after the last operation, it again drew up suddenly in the presence of Dr William Hunter and Mr Watson. She complained of great uneasiness in the body of the biceps muscle, as if matter were forming there. The breast also became full, but subsided on the application of a poultice, as it had done on a former occasion, on being punctured under the erroneous supposition that matter was formed there. The throbbing continued, and some sort of thick stuff came from the orifice where she had been blooded. Before having recourse to amputation, Mr Watson determined to try another incision made with greater freedom. He accordingly began it in the middle of the biceps, carrying it deep into the body of the muscle, in the direction of its fibres, and continued it into the tendon to a little below where it sends off the fascia of the fore-arm. This time the operation was permanently successful. The woman exclaimed, "Now you have indeed cut the cord that bound up my limb." But it is of importance to observe, that "there was a large discharge of lymph from an orifice like a pin-hole at the lower edge of the wound, which, upon bending and extending the arm, flowed more freely. A solution of blue vitriol stopped the discharge in about three days. Mr Watson has no doubt of its being supplied by a divided lymphatic; but connecting it with the sudden relief obtained at the same time, it appears to me that it may have been an effusion beneath the fascia, which was then let out. It is, however, proper to mention, that Mr Watson re-

lieved, in the same manner, another case (p. 266.) of contraction, arising from the same cause, in which no discharge took place. Still it is difficult to reconcile the speedy relief obtained, with the supposition that the affection was owing to inflammation of the fascia. I am rather disposed to think, though very uncertain, that it arose from the removal of pressure by the fascia upon a deeper-seated diseased part.

“ It may always be concluded,” says Mr Swan \*, “ that *a nerve* has been injured, if upon the infliction of the wound very acute pain is complained of, and especially if it is in the situation of a nerve; but what will make it still more probable, will be the extension of the pain in the course of the nerve, and convulsions, or other symptoms of great nervous irritation, accompanying it, which it is frequently difficult, and sometimes impossible, to appease by any remedies.” (P. 105.)

The diagnosis between such an affection and pure cellular inflammation is evident; but it frequently happens that they are complicated with each other, and then it becomes of importance, as influencing the practice, to ascertain which of them is to be considered as primary, and which as secondary.

Mr Abernethy, from physiological grounds, was inclined to doubt that the partial division of a nerve could be the cause of the symptoms ascribed

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\* A Dissertation on the Treatment of Morbid Local Affections of Nerves, to which the Jacksonian Prize was adjudged. 8vo. London, 1820.

to it, and expressed his opinion that “the disease consists in the inflammation of the injured nerve in common with the other wounded parts,” and that it may happen with or without a total division of the nervous cord. (P. 162.)

Mr Swan, although he shews satisfactorily that bad symptoms may, and occasionally do, arise from partial division of a nerve, independent of inflammation, or any thing else that could irritate the nerve (p. 109.); yet admits that by far the greatest number of injured nerves in venesection, are made troublesome by the patient using the arm too soon, and bringing on inflammation. (P. 115.)

On the subject of the complication of nervous with cellular inflammation, my experience is exceedingly limited. During the slight operation which was followed in case No. 24. by inflammation, the complaints made by the patient suggested immediately the idea of a nerve being much irritated; and in many of the cases where abscesses formed, paralysis or numbness of the extremity was observed, and in some cases, as in Mr Burton’s, singular nervous sensation was excited by touching certain parts of the surface. But these I consider as secondary effects.

Mr Sherwen\* has detailed a case in which there seems to have been a complication of punctured nerve, with diffuse inflammation.

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\* Edinburgh Medical Commentaries, vol. iv. p. 210. 8vo. Edin. 1776.

As additional examples of complication of cellular inflammation with nervous affection, I might quote the celebrated case of Charles IX. so quaintly related by Paré, in which extreme pain was felt at the moment of the puncture, soon extending over the whole arm, with very great tumefaction and contraction of the arm, lasting more than three months; also Mr Sherwen's third case, (p. 223.) In Mr O'Halloran's cases, the pain felt immediately from the puncture of the lancet, indicates rather an injury done to a nerve than to a tendon; and it is not impossible, that also in Mr Watson's cases an injured nerve was the cause of many of the most distressing symptoms.

It is sometimes exceedingly difficult, especially when the cause has not been ascertained, and the body is not examined after death, to distinguish the disease, from *typhus fever*, with intense pain in one of the shoulder-joints, which occasionally occurs in rheumatic typhus fever. When Dr Colles first saw Mr Dease, he supposed him labouring under high symptoms of the prevailing fever; and Mrs Craig was treated by myself as a case of continued fever, with unusual symptoms. As an illustration of the diagnosis in doubtful cases, I may state my reasons for thinking that the case, of which an outline has been given in page 564, was really an instance of this disease. Independently of exposure to a sufficient cause, these were the suddenness of the attack, and the rapid progress of the disease,—the

peculiar nature of the local symptoms, affecting first the shoulder and then the loin,—the absence of typhomania, coma or delirium, except of the most transient kind,—the patient remaining conscious of his state, and interfering with its treatment,—the taking leave of his friends, and the death occurring before the period when typhus commonly proves fatal.

### *Prognosis.*

The Prognosis in diffuse cellular inflammation is regulated by the cause, extent, and severity of the disease. It would appear that fatal cases occasionally occur from many of the causes, but fortunately most of them more frequently give rise to slight cases. Still, however, the occurrence of the disease is more alarming after some causes than after others. Of the former description are the bite of a venomous snake of sufficient energy, dissection, ligature of a vein, and venesection; and it seems to be least dangerous in the form of *phlegmatia dolens*. The danger is much less when the fever has the inflammatory than when it has the typhoid type. The presence of delirium or stupor, the accession of fresh rigors, difficulty of respiration, great depression of mind, and sudden debility, are all of bad omen. There is, in general, less danger when the disease commences in the part to which the cause has been applied, and extends progressively from it,



than when it suddenly attacks a distant part, nearer to the trunk of the body, as the axilla. Great tumefaction in the region of the pectoral muscles, and on the neck, is a bad sign, but the extension of the inflammation down the sides is rather favourable. I would also consider the supervention of erysipelas, especially when accompanied by a mitigation of the general symptoms, as of good portent; and the formation of phlegmon or subcutaneous suppuration, generally indicates that the progress of the disease is arrested, and that its termination will be favourable, if properly treated.

### *Prophylaxis.*

The only circumstance in which we are aware of being about to expose ourselves to a cause capable of exciting the disease, is when we are to be engaged in morbid dissection. Some persons are much more susceptible to the impression of dead animal matter than others, so that they cannot open a body without having their skin and system somewhat affected. Such persons may be well excused for putting on gloves when they engage in this laudable, and to them dangerous, pursuit, as great dexterity in morbid dissection is seldom required; and it is but a proper precaution in every person to anoint their hands thoroughly with camphorated oil, or simple axunge, before handling the viscera. It might appear unnecessary to caution any person ha-

ving an abrasion on any part of the hand, against exposing it to the contact of dead animal matter, without defending it completely by adhesive plaster, if it were not but too certain that this simple precaution is often neglected.

### *Local Treatment.*

When any accident has happened, leading us to suspect that it may be followed by such dreadful consequences, our first object is to prevent the cause from acting upon the system. The two most alarming circumstances are the bite of a poisonous snake, or a prick in morbid dissection. We may attempt to remove the poison applied before it has time to act, to destroy and render it effete, or to enable the system to resist its impression. For attaining the first object, nothing is more effectual than instantly sucking the wound with the utmost force, by which means the poison is often removed, and no fear need be entertained of any bad effects upon the mouth which receives it, for, even if it were not immediately spit out, yet it requires a much larger dose of poisons of every kind to act upon an entire mucous membrane, than when applied to the abraded skin or wounded cellular substance. Accordingly, it is the constant practice, when a prick is received in dissection, to suck the wound; and I have little doubt, that by this simple expedient bad consequences are frequently averted.

Celsus recommends the use of the cupping-glass as a mode of suction. To this, when practicable, I see no objection; but I am uncertain whether the previous scarification he recommends be advisable, as we may thus effectually inoculate the system with a poison, which might have otherwise been inactive, by being in contact only with a non-absorbing substance.

“ Igitur in primis super vulnus id membrum deligandum est; non tamen nimium vehementer ne torpeat; dein venenum extrahendum est. Id cucurbitula optime facit. Neque alienum est, ante scalpello circa vulnus incidere, quo plus vitiati jam sanguinis extrahatur \*.”

The treatment which is next in point of simplicity is careful ablution with water; but I cannot say whether cold or hot be preferable. Hot water is supposed to be most active as a detergent, and cold water to counteract absorption most. Perhaps first cold, and then hot, should be used. The destruction of the poison, if any be left, is often attempted by chemical caustics, especially by nitrate of silver, with which every person engaged in dissection should be provided. Others prefer strong nitrous or other mineral acid, as being more effectual, and others caustic ammonia or potash. Whichever of these most speedily and effectually decomposes and destroys the nature of the poison is to be

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\* Lib. v. cap. 27. De Vulner. quæ per morsus inferuntur.—  
CELSUS,

preferred ; but this is unknown. Nitrate of silver acts more slowly, and is less easily applied in sufficient quantity than the others. Acids instantly coagulate animal fluids, and render them more adhesive, while alkalies dissolve them, and render them easily removed by ablution. On this principle, too, soap is employed. But of all the means of destroying the properties of the poison, none is equal to the actual cautery or excision, when practicable. But these violent means will rarely be resorted to, unless where, as in the bite of poisonous snakes, there is otherwise little chance of a cure.— (Ranken.)

For enabling the system to repel the poison, when it is not or cannot be removed, or to counteract its being absorbed, the application of powerful stimuli to the part has been recommended. Thus, Dr Colles directs that the anatomist should plunge his finger into a cupful of *oleum terebinthinæ* the moment it is wounded, in the hope that the irritation may counteract the power of infection, or alter the mode of inflammation in the wound ; (p. 222.) This practice was also recommended by Paré, Heister and Wiseman, and is confidently applied to a puncture from a pin or needle by country people, to prevent festering. (Sherwen, p. 227.)

The application of ligatures to the limb above the injury, has been often recommended and practised, either to give time for the employment of other means, as by Celsus, or to prevent the absorption of the poison, according to popular opinion, or

to set a limit to the extension of the disease excited, by causing adhesion of the vein, according to Mr John Hunter, or by setting bounds to the swelling, according to Sir E. Home; but I apprehend that compression can rarely be effectually employed, except with the two first intentions. The judicious application of a ligature by Mr Burton, in his own case, seems to have set a limit to the extension of the disease towards the trunk, and was probably the means of saving his life. Paré bandaged the whole arm, in Charles IX.'s case. "It seems," he says, "to corroborate and restrain the muscles, express and return towards the upper parts the humor already descended, and hinder a fresh flux of more."

When the cause, whether it be a material poison, or only irritation, cannot be prevented from acting upon the system, its effects are of two kinds, local and constitutional, and remedies are in like manner directed against each.

With the view of reducing the local inflammation, I have often found the continued application of a considerable degree of cold eminently beneficial, so long as no phlegmon had been formed, for after that period cold seemed hurtful, and fomentations and warmth were beneficial. But I believe, that in the choice between these opposite measures, we may safely trust to the sensation of the patients, and employ cold or warmth as most agreeable to them. This was strikingly exemplified in the case of Harper. In the case related by Mr Sherwen, warmth perseveringly employed was throughout injurious,

as has been candidly remarked by the author himself, (p. 226.)

In the first stages, the detraction of blood from the part by the free application of leeches, or numerous scarifications, is never to be neglected. The former I have used in many cases, and I have never seen the dreaded mortification of their bites. Indeed, were they to excite inflammation of the skin, I should be inclined to look upon it as a favourable circumstance, by diverting the inflammatory action from the internal and more important tissues. It is upon this same principle, that the action of blisters is frequently of service in the early stages, although afterwards their action may be explained by the large discharge of serum to which they give rise; and it is upon this principle, that the application of the actual cautery may prove serviceable. After I had learned the untractable nature of this disease in the severe cases, I conceived a notion, that we might avert its danger, if we could excite phlegmonic inflammation in the part, hoping that by this means a limit might be put to its spreading; and I even ventured to propose the employment of the actual cautery with this view. But I find that I have been anticipated by M. Morand, who actually carried the idea into practice, and apparently with good effect, (p. 273.)

In many of the cases leeches were very freely applied to the seat of the pain, swelling, and inflammation, and, although in some instances they were supposed to do harm, I am rather disposed to think

that the subsequent increase of inflammation was the natural progress of the disease, which they were unable to check. Of this at least I am certain, that in none of the cases in which they were applied under my observation, did they shew the least tendency to fester or become gangrenous. I paid particular attention to the state of the leech-bites in the body of Mr Young, to whose side they were applied before the skin became affected, and found them perfectly healthy, and in general healed, although some of them penetrated through the skin into the cellular membrane. I may remark, that in this disease leech-bites commonly bleed very profusely.

In those cases, where blisters have been applied, they have in general produced a very copious discharge, as in Mrs Monro, and have healed very readily, without shewing any disposition to become gangrenous. In M. Morand's second case they were evidently of great advantage.

As soon as any fluid seems to be effused into the cellular tissue, which in the severe cases is very soon, I am convinced that the best practice is to give it immediate vent by free incisions. When, deceived by the sensation of deep-seated fluctuation, we content ourselves with plunging in a lancet into the part, we are disappointed by no discharge taking place; still the puncture sometimes proves of essential service, by facilitating the discharge, as soon as the effused matter becomes sufficiently fluid to flow out. Thus, the deep puncture made in Mr

Blyth's side appears to have been the eventual means of saving his life.

But a much bolder practice is preferable, and one which was long ago recommended by Mr O'Halloran, on the sure ground of experience. He gives an account of the treatment of three cases, in all of which the disease followed venesection. In the first case the arm was scarified lightly in several places, but the patient died on the 9th day. The second case was seen by Mr O'Halloran on the 5th day after, and again on the 8th. He now resolved to make "many profound incisions the length of the arm, in hopes that the activity of the stupes and poultices would sooner pervade these parts." Wherever he made his incisions he found the adipose texture swelled and spongy, so much, that at the depth of an inch he did not cut through it, shewing that little danger accompanies profound incisions in such a state. Water, clear as crystal, started from the wounds, and was increased by pressing on the contiguous parts. His first incisions were made near the bend of the arm, and round it, in nearly parallel lines, each above an inch long, and about half an inch distance. In about two hours he made a similar range of profound incisions, about two inches higher up the arm, and next day a third and fourth set; the swelling of the arm returning between each. At night the arm was visibly lessened, and on renewing one of the incisions over the biceps muscle, about a table-spoonful of pus, of a pale whiteness, spouted out of the orifice, and, for the first



time, the patient sensibly felt the heat of the stupes, and the activity of the dressings, which, he observed, produced a tingling heat all over the arm. Next day more profound incisions were made, and on opening the sores at night, those of the arm which before seemed so deep and extended, now appeared small and superficial, on account of the subsiding of the swelling of the skin and *corpus adiposum*. After this he speedily recovered his health, and the use of his arm and fore-arm. The dressings applied were of the most stimulating nature, and he got a liberal allowance of wine and generous diet.

A third case, where inflammation with sore orifice occurred after bleeding in the foot, was treated in the same way, and with equal success.

The deep scarifications, so successfully employed by Dr A. C. Hutchinson for the cure of *Erysipelas phlegmonodes*, is a further illustration of the great advantages of this practice in diseases of this nature.

Sir E. Home recommends as the only rational treatment to prevent the secondary mischief from the bite of a poisonous snake, making ligatures above the tumefied part, to compress the cellular membrane, and set bounds to the swelling, and scarifying freely the parts already swollen, that the effused serum may escape, and the matter be discharged as soon as it is formed ; p. 88.

*General Treatment.*

I wish that I could speak of the general treatment proper in the dangerous varieties of this disease, with as much confidence as I have done of its local treatment; for, although in some cases life seems to have been preserved or prolonged by medical assistance, and although in others it may have been lost, from the means employed having been inefficient or improper, yet cases occasionally occur which baffle the utmost efforts of our skill.

A very brief historical sketch of the treatment employed at different times will suffice.

Celsus prescribes early stimulation. “Necessarium est exsorbere portionem meri veni cum pipere, vel quidlibet aliud, quo calor movendus est, ne humorem intus coire patitur, nam maxima pars venenorum frigore interimit.” L. v. cap. xxvii.

Dionis recommends a mixed practice. He says, “That the swelling, after it is begun, will grow to an extraordinary bulk, if we do not endeavour to divert the torrent by plentifully bleeding the other arm, by cordials internally administered, and the application of proper remedies to stop the course to these humours, to resolve them, and to defend the arm from those in which they are soaked.” P. 379.

Mr O'Halloran, besides local treatment, took from his first patient some blood, and ordered an active warm purge, and afterwards gave the bark in substance, and strong broths, to assist nature to re-

ject the load of oppression, but he died. His second patient was bled, got a warm purge, then strong port-whey, claret, and strong seasoned broth; his recovery was complete. The third patient had an irritable stomach, and got first a light pleasant lemonade, and at night two grains of mercury, which purged smartly. Next day, a decoction of bark, with elixir of vitriol, was given, which the stomach constantly rejected. She survived, but was paralytic. In conclusion, Mr O'Halloran states, that, although he made use of bloodletting in his first two cases, yet, upon mature consideration, he condemns it (purely on theoretical grounds), "as rather weakening nature than assisting us," except upon some very urgent or unforeseen occasion. But he recommends warm active purges, one or two, according to the indications. "The spirits, he says, are likewise to be supported with strong and seasoned broths, wine, with a bit of toast, jellies," &c. P. 104.

Mr Abernethy scarcely notices the general treatment to be followed in the ill consequences of venesection. In inflammation of the absorbents, he recommends the taking of some gently purgative medicine; and in that of the fascia, he merely says, that, doubtless those general means which are reductive of inflammation should be employed.

Mr Travers is not more particular in regard to the general treatment in cases of inflamed vein; but his patients seem generally to have been bled and purged.

Dr Colles found large doses of opium to fail in procuring the slightest mitigation of pain in Mr Hutchinson's case, and the fever was not in the smallest degree controlled by the usual remedies. In a more advanced stage, the fever continued unabated, and his strength seemed nearly exhausted, and was supported only by large quantities of wine. Professor Dease was bled, got purgatives and glysters, laudanum, and carbonate of ammonia, wine-negus, and cordials, but in vain.

The man bit by the rattle-snake, in London, got *Aqua ammoniæ puræ*, and *Spiritus ætheris sulphurici*, with *Mistura camphorata*, but they failed in preventing the fits of faintness, and in exciting the pulse, which was feeble, and afterwards became very frequent. He then got opium till it seemed to produce drowsiness, and afterwards brandy, which was exchanged for wine on his pulse becoming slower, full, and strong. At the same time, he used the most nutritious diet that his stomach could bear, jelly, veal, coffee, and porter. The stimulant treatment was continued until the death of the patient, which seemed to take place not from the primary, but from consequent, mortification.

It would be an omission, in treating of this subject, to pass over the acute observations of Dr Ranken\*, on the effects of ammonia against the bite of the Cobra di Capello, from which he concludes, "that the spirit of ammonia, given to a dog five

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\* Edin. Med. and Surg. Journ. vol. xviii. p. 235.

minutes after he has been bitten by the hooded snake on the belly, or any part destitute of large bloodvessels, in doses of one drachm, repeated every ten minutes, may save the animal's life." "But when not exhibited in less than thirteen minutes after the bite, it is probable that neither spirit of turpentine, spirit of ammonia, nor spirit of wine conjoined with ammonia, will cure a dog, or even much retard the progress of dissolution. Dr Ranken was not ignorant of the very different conclusions drawn by Fontana, from the numerous experiments he made on the poison of the viper; but adopting, in regard to them, the doctrine advanced by Mr Williams†, that the venom produces at first violent excitement, soon followed by extreme depression, and that the cure must consist in the counteraction of some powerful stimulant, he attempts to account for the failure of the Italian philosopher, from his exhibiting the antidote as soon as the animals were bitten, by which a strong stimulus acting simultaneously, instead of counteracting the poison, was made to assist it in exhausting the powers of life.

Dr Ranken did not find any reason to confide in the spirit of turpentine, but his experience is decidedly in favour of spirit of wine. A sepoy who had received two doses of alkali, of two drachms each, took a wine glassful of brandy every ten minutes, and recovered, after having lain insensible a considerable time. Another drank half a glass al-

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\* Asiatic Researches, vol. ii.

ternately with the ammonia, and was likewise cured ; and a third got a glass of brandy every ten minutes, to the extent of two-thirds of a bottle, and was soon well, without being at all intoxicated.

Similar effects are observed from the use of this highly diffusible stimulus in other affections of the same kind. My own brother, when bathing in the sea off Jaggernaut, was stung by some venomous marine animal. His whole body instantly swelled enormously, and he became delirious. No medical assistance being at hand, the fishermen undertook to cure the affection, which was familiar to them, and they effected it by giving large quantities of brandy.

Almost all the specifics which have been at different times extolled for the cure of the bite of poisonous serpents, on the authority of the natives of those countries in which they exist, are stimulant or tonic vegetables, of which a long catalogue might be given. These have all failed when they have been tried by scientific practitioners ; but are we, on that account, to consider them as utterly inefficacious ? There is commonly some ground for popular opinion, when it is widely diffused ; and not unfrequently, after a length of time, modes of practice in use among the vulgar, which were rejected as contrary to the prevailing doctrines, have afterwards been found to be conformable to the principles of a more enlightened age.

The cases which have fallen under my own observation, have been treated almost entirely anti-

phlogistically, and in the greater number the lancet has been repeatedly employed. Both from the relief, which has often been immediately given, as well as from the indisputably inflammatory nature of the disease, there remains no doubt in my mind as to its propriety in most cases ; and although it has failed in many, this must be ascribed to the intensity of the disease, which no depletion, consistent with the continuance of life, is able to overcome. Thus Mr Cumming was bled no less than four times, besides the repeated application of leeches, but in vain ; and the case recorded by Dr Le Herissé shews, that very copious abstraction of blood is unable to prevent or mitigate the disease in every instance, for the patient was bled on account of epilepsy, on the 1st November, twice from the arm ; on the 8th from the foot ; on the 10th and 13th from the jugular ; and on the 16th from the arm, and this puncture was the cause of the disease : to cure the disease, on the 18th the temporal artery was opened, and blood freely abstracted, but he died on the 23d.

The blood drawn has in general been remarkably sizzly, some describing it as covered with a yellow crust, and others comparing it to calves-foot jelly. This appearance is owing to a very complete separation of the fibrine and red globules, while at the same time the fibrine does not contract and express the serum, as it does in what we call cupped blood.

Thus we see, that, in the treatment of this disease, very opposite means have been employed, and both appear to have been occasionally successful,

and both have failed. But their salutary effects depend upon different principles. In general, by the antiphlogistic treatment, we are enabled so to lessen the existing inflammatory state, that the system is capable of recruiting and performing the office of restoration to health; but, on the other hand, by the free exhibition of diffusible stimuli, we seem, in some instances, to impart to the system such a degree of preternatural energy, as to resist and extinguish the diseased action, after which health is again restored by gradually abstracting the cause of the artificial and salutary excitement. In some cases, however, we are perplexed by opposite indications, when an extreme degree of debility requiring cordials, exists along with intense inflammation, which can be conquered only by further depletion. In these cases, we must have recourse to the alternate, or even simultaneous, employment of the most opposite remedies.

During the prevalence of the Brunonian doctrine, it was considered, both by its proselytes and opponents, to be quite unscientific to employ at the same time antiphlogistic and stimulating means. But this precept proceeded upon a very partial and limited view of the subject, for it is evident, that venesection, for example, and alcohol, are by no means strictly antagonist powers, and that in many cases it may be advantageous at the same time to diminish the quantity of circulating fluid, and to excite the living solid to greater action. Accordingly, abundant experience has left no doubt



that excellent effects have often been produced by combining the depletory with the cordial treatment, and, in many cases, a mixed treatment will be found the most beneficial.

Hitherto I have considered the debility we have to combat, as the effect of preceding excitement exhausting the powers of life ; but, in the very worst cases, no symptom of excitement precedes the appearance of extreme debility, which may thus be considered as primary. It may be said, that in such cases, the cause, whatever it may be, has operated on the constitution as a direct sedative, reducing its powers, and rendering them incapable of reaction. But this explanation is equally inconsistent with facts ; for if the patient survive a certain length of time, this state of debility and depression is succeeded by a very high, but peculiar, state of excitement, producing in its turn true exhaustion, and often irrecoverable debility. In fact, the state of excitement in every inflammatory disease is preceded by a state of depression. This is universally acknowledged, and, *post horrorem*, forms a part of every definition of febrile diseases, but still the importance of the cold fit has not been sufficiently appreciated, except in the case of ague. It must, however, be admitted, that in the pure *phlegmasiæ*, the cold stage is short and transient, and the hot stage long and durable. Hence our treatment is chiefly, or almost solely, adapted to the state of excitement. But it appears to me, that the malignant form of all inflammations, such as occurs in some instances

of diffuse cellular inflammation, commences with an intense and long continued cold stage, in which the patient may be carried off before reaction is established.

According to this view of the disease, we should treat those malignant cases, which begin with the symptoms of extreme debility, on the same principles that malignant intermittents are treated during their dangerous cold stage; that is, we should administer diffusible stimuli freely until the commencement of reaction, when the antiphlogistic treatment should be vigorously enforced.

CASE  
OF  
SEVERE INJURY OF THE HEAD;

WITH SUPPOSED TRANSVERSE FRACTURE OF THE  
BASE OF THE CRANIUM, FROM WHICH THE  
PATIENT RECOVERED.

By J. F. MACFARLAN, Esq. Surgeon, one of the Presidents  
of the Royal Medical Society.

*(Read 2d July 1823.)*

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**I**NJURIES of the head occur so frequently, and are in general so uniform in their symptoms, while their mode of treatment is now so well understood, that an individual case seldom presents features of importance such as to render it worthy of being recorded.

The case I am now about to detail, forms, I conceive, an exception to this remark; and more especially as it seems to belong to a species of counterfracture, which is generally fatal.

H. Gilchrist, æt. 50, labourer, when riding home, on the evening of the 8th May 1821, on a brewer's cart, was suddenly thrown from it, and fell insensible

to the ground. On being raised, hæmorrhage was observed from the ears, the blood upon the spot being, as it was supposed, to the extent of 4 oz. and, on his reaching home, the straw on which his head was laid was soaked with the blood, which was still flowing freely.

The condition in which I found him about two hours after the accident, will be best described in the words of the report taken at the time.

He is somewhat comatose, but, when roused and spoken to, answers, though not very distinctly, and rather incoherently. Complains of pain of head, especially when touched, and chiefly behind the right ear, where there is an evident softness, and slight fulness; but no depression of bone, nor other injury, can be discovered in any part of the cranium. There is no external wound. The right eye seems sunk in the orbit; whilst the superior palpebra is partially paralysed; both pupils are dilated, but contract readily on the approach of light. There is still a considerable hæmorrhage from both ears, the blood flowing in a constant small stream. He also complains of pain of the side, when touched, near the cartilage of the fourth rib, but no injury can be perceived. Has had some vomiting. Pulse 48. Skin cool. General health good. Habits regular.

Visited him again about two hours afterwards. Nearly in the same state, but more easily roused. There appears to be no loss of muscular power, as he is impatient of controul, and is kept in bed with

difficulty. 25 oz. blood taken from the arm, after which the pulse has risen to 57.

9th.—Has passed a tolerably quiet night, though sometimes retching, and starting suddenly from bed, looking round, and lying down again. Hæmorrhage from ears continues; he complains of his head, and has had no alvine evacuation. 14 oz. blood taken from the temporal artery; head shaved, and cold applications ordered to it. An enema likewise directed.

10th.—A quiet night, though starting occasionally. Suffers from pain, and is somewhat delirious, not knowing those around him, or the place where he is. He is often calling for his clothes, and desiring to be sent home. Hæmorrhage from the ears has ceased. In the evening complains much of his head, especially of the fore part, which is painful to the touch. Pulse 50, beating feebly; heart beating strongly. Enema has operated well. Cold applications to be continued.

11th.—Bad night; face flushed; complains much of headache, and calls for warm applications to it, but when the cold is applied, feels relieved. No alvine evacuation. No thirst. Pulse 50, irregular. 12 oz. blood taken from the arm, and v gr. calomel, and x gr. jalap given.

12th.—Bad night. Seems more sensible; answers questions more distinctly, though still unconscious where he is. Complains much of his back. Discoloration behind both ears. Tongue tolerably clean. Pulse still about 50, and irregu-

lar, but rising rapidly when he is moved or agitated. Has called for drink, being the first he has taken since the accident. Belly open. Cold applications to be continued.

13th.—A good night. Complains much of his head, and is constantly calling out to be bled, unconscious of having undergone that operation, yet is, on the whole, rather more sensible. Right eye still sunk. Appears to have difficulty in putting out his tongue. Pulse 60, rather feeble.

15th.—A restless night, with low delirium. Pupils dilated, but contracting on the approach of light. Thirst. Pulse 64, regular. Has passed his urine in bed. Venesection attempted, but from the violent resistance made, a small quantity only of blood procured. Cold applications to be continued.

On 16th and 17th much in the same state. Urine scanty and high coloured. Alvine evacuation by means of purgatives. Strength diminished. Urine occasionally passed in bed. Lower part of the face, and the tongue when put out, seem slightly drawn to the right side.

18th.—A bad night, with constant delirious muttering. Complains much of pain, especially of his back. Urine and fæces passed in bed. Pulse 84, intermitting. 18 oz. blood taken from the arm. In the evening pulse 120, and feeble. He has continued muttering, and complained of pain during the day. No alvine evacuation. Ice directed to be applied to the head, and a purgative given.

19th.—During the night, occasional violent delirium and screaming from pain. Restless, and talking incessantly during the day. Has felt chilly from the ice; feet cold. Paralysis of face continues. Urine high coloured, with lateritious sediment, and some of it passed in bed, as also some fæces. Pulse in morning 60, evening 84. Ice to be applied occasionally, and limbs kept warm.

20th.—Has continued restless, and has also had frequent purging of fluid and very fœtid fæces. Pulse 84, intermitting and small. Feels occasionally chilly. A little wine to be added to his drink.

21st.—A good night. Somewhat more sensible, knowing those around him better. Complains of pain all over his body. Urine and fæces passed in bed. Face more drawn to right side. Has had 4 oz. wine last night. Pulse 74, soft and intermitting. To continue the wine.

22d.—Improved. Right eye seems more natural, and paralysis of the palpebra removed, though not that of the lower part of the face. Pulse, in morning, 90; evening, 76.

25th.—Was restless during the night. Converses more rationally, is sensible where he is, and knows those about him. His memory is very indistinct; thinks he has been ill only one day. Appetite voracious: has eaten a considerable quantity to-day of solid food, seemingly not conscious when he has enough. Fæces and urine natural. Tongue moist. Pulse 80, regular. Recommended that the quantity

of his food should be limited, and the wine diminished. An anodyne draught at bed-time.

June 2d.—Headache ; leeches applied.

3d.—Conscious of having been ill for some weeks.

5th.—Recollects his riding in the cart.

From this period the patient continued to improve, although but slowly. He was still carefully attended, but no reports were taken till the 10th July, when the following was noted.

Since last report has continued to improve, and is now able to walk about with ease, but has not been able to work. Has no farther recollection of the accident. Continues to suffer much from severe pain in the fore and superior part of his head ; when he leans forward is apt to fall to the ground. Remembers the bleeding with leeches.

His improvement still continued steady but slow. It was fully eighteen weeks before he could return to his employment, and when he did, he was able to do very little for a long period, the giddiness troubling him so much as to render repeated venesection necessary. For about a year and a half he was bled every month, and at one time on three successive nights. Since this period he has suffered twice from accidents ; once from a fracture of the arm, and more lately from a fracture of the femur.

Nor has his mind attained its original strength ; his recollection of what occurred previous to the ac-



cident being more perfect than of what happened subsequent to it. His judgment is impaired, and his temper irascible; yet he takes his food as well as ever, and is in other respects healthy.

I cannot conclude the history of this case, without offering my grateful acknowledgments to Professor Turner and Dr Maclagan, who both occasionally accompanied me in my visits; and particularly to Dr Donald M<sup>c</sup>Intosh, whose kind and unwearied attention throughout contributed much to the ultimate recovery of the patient.

The case, as I have hinted, appears to belong to that particular species of counter-fracture first described by Dr Thomson, in the 8th volume of the Edinburgh Medical and Surgical Journal. All the leading symptoms mentioned by this acute observer, such as hæmorrhage from the ears, stupor, and diminished frequency of the pulse, were present; and when to these we add other subordinate circumstances of the case, namely, the sunk appearance of the right eye, the swelling and discoloration behind the ears, the paralysis of the face, the involuntary discharge of fæces and urine, together with the derangement of the intellectual faculties,—little doubt, I imagine, can remain, but that such was the true nature of the injury. From the foregoing narrative, therefore, encouragement is given to our perseverance in affording relief, even under the cheerless prospects that this variety of accident generally presents.

## CASES

WHICH OCCURRED IN THE

PRACTICE OF JAMES BROWN, Esq.

*SURGEON, DOMINICA ;*

CHIEFLY ILLUSTRATIVE OF CERTAIN MORBID PREPARATIONS PRESENTED BY HIM TO THE MUSEUM OF THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

Communicated by R. HAMILTON, M. D. Keeper of the  
Museum.

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**T**HE preparations of which the following cases contain the history, were forwarded from Dominica by the gentleman in whose practice they occurred, to the care of my respected friend Mr James Law, with directions that they should be presented to the Museum of the Royal College of Surgeons; and they were accordingly delivered to me by Mr Law last autumn.

In the month of May I had the pleasure of seeing Mr Brown himself, who then furnished me with the following *Cases*, written upon loose sheets torn from his case-book, where they had been regularly recorded as they occurred.

The cases do not connect with or illustrate each other, as every one of them bears on a department of pathology different from the rest. They have all, however, a considerable degree of individual interest, and some of them are very singular.

The cases are given in Mr Brown's own words; but I have taken the liberty to preface several of them with a single introductory remark.



The first Case is an example of very *extensive ossification of the Dura Mater*, accompanied with coagula of blood in the substance of the brain,—the result of hæmorrhage from some of its vessels, and the cause of paralysis.

#### CASE I.

Mamiett, a free woman of colour, æt. 40, early in the month of March began to complain of headache, which was shortly followed by dimness of sight, so that she was afraid of losing it. These symptoms continued more or less till the 25th of the month, when she was seized with a fit of apoplexy. For this she was bled, blistered, and put upon a course of calomel and opium. For five days she lay nearly insensible, although she took what was offered to her, and even attempted to speak. After this she began to recover, but with almost the total loss of the left side. She was speedily put upon a course of tonics and sea-bathing, and was so well on the

12th of April, though still labouring under partial hæmiplegia, as to require no further attendance.

She continued to enjoy pretty good health during the summer, although subject to occasional headache and dimness of sight, the eyes at the same time having a curious indescribable appearance.

On the 20th of August, she was seized with violent pain of the head and neck, and now lost the use of the right side. The head fell down on the right shoulder, and she had no power to raise it. At the same time, she answered every person distinctly, and could take nourishment and medicines when offered her. Under the same treatment as that employed in the former attack, she so far recovered as to be able to sit up and converse with her friends. On the 5th of September, however, she was suddenly seized with convulsions, and died.

*Dissection.*—The skull-cap separated easily. The dura mater appeared as if forced upwards, by a number of small hard tumors running along on each side of the longitudinal sinus. On inverting it, extensive ossification was found on the dura mater and falx, extending from the crista-galli to the tentorium. On the right side, the bony deposition extends to 3 inches, and on the left  $2\frac{1}{2}$ . It is composed of irregular shaped spiculæ, from  $\frac{1}{4}$  of an inch to  $1\frac{1}{4}$  inches in length, and as much in breadth: some of the spiculæ are about a quarter of an inch in thickness. The dura mater appeared in a state of high inflammation, and the pia mater very vascular. External appearance of the brain natural.

The right ventricle contained about  $\bar{z}$ j. of limpid serum. The plexus choroides, enlarged and hardened. Septum lucidum much thickened, and of a brownish-grey appearance. At the superior margin of the ventricle, in the corpus callosum, and descending towards the thalami, a sac was observed, containing about half an ounce of coagulated blood, and a little pus. On opening the left ventricle, about half an ounce of limpid serum immediately escaped, and this was followed by some bloody matter. On more freely exposing the ventricle, an abscess was discovered, just ready to burst, which was found to contain 3 or 4 oz. of blood and sanious matter. When this was removed, the lateral and inferior portions of the hemisphere were much broken down, and as thin as a shell. The cerebellum was sound, and a considerable quantity of blood was found in the base of the cranium under the tentorium.

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The next Case may be denominated *Rupture of the Heart*, as, on dissection, the pericardium was found full of blood. It is singular, not only as occurring in a child four years of age, without any previous symptom, but especially from its being a rupture of the pulmonic artery, the first, so far as I know, that is put on record. In six out of eight unpublished cases, with which I have become acquainted, the rupture was at the root of the aorta. I

may here notice a singular specimen of rupture, from external violence, presented by Dr John Gairdner to the Museum of the Royal College of Surgeons. A cart-wheel had passed over the body of a child, æt. 10: not a rib was broken; but, upon dissection, the heart was found nearly completely divided into two halves\*.

## CASE II.

Celeste, a little black girl, about 4 years old, on the forenoon of June 10. 1818, was playing about in perfect health with the other children. Her

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\* Dr Gairdner has kindly favoured me with a copy of the notes of this case, which cannot be read without interest.

“ The dissection was performed by me on the 12th July 1815. The subject was a girl of ten years of age, and I was informed that her death had been occasioned by the wheel of a loaded cart having passed over her body the preceding day. Immediately before the wheel went over her, she gave a scream, but her death was quite instantaneous, for she was never afterwards heard to utter any sound whatever.

“ There was scarcely any perceptible trace of the impression of the wheel externally, and no subcutaneous extravasation, except a very slight one under the left nipple. The abdomen, which was first examined, was perfectly natural.

“ In the thorax the only deviation from the healthy state was rupture of the heart, with extensive laceration of its substance. Both ventricles, and both auricles, were laid open by the laceration, and the septum torn to shreds. About one-half of the substance of the heart had burst a way for itself through the pericardium into the right cavity of the thorax, where it was found immersed in a very large quantity of grumous blood, and still attached to the other part by means of a small portion near to the apex, where the rent had stopped.

“ Not

mother took her up, and placed her on her knee, when, without the least notice, she dropt lifeless to the ground.

*Dissection.*—The pericardium was found full of blood. On examining for the orifice, it was found in the pulmonic artery, immediately after it immerges from the ventricle. It appeared as if the different coats of the artery had been gradually separated, and a slow and gradual ulceration had produced the orifice, which was large enough to admit a common quill. She had enjoyed excellent health previously to her death, and I saw her the same morning with no complaint whatever.

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The 3<sup>d</sup> Case may be regarded as a case of death from Lumbrici; where the disorder produced upon the frame at large was very great. The lumbrici had taken possession of the stomach and intestines, and had penetrated into the liver. Dr Baillie represents the occurrence of worms in the liver as hypothetical. He mentions, that they had been said to occur in cysts, and in the biliary ducts. In the present case, some were found in the gall-bladder.

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“ Not a single rib was in the slightest degree injured, nor any other injury done, with the exception of a slight bruise of each ankle, inflicted by the foot of the horse before the wheel had passed over the child's body.

“ The urinary bladder was found completely contracted, and quite hard.”

My friend Professor Turner and I examined the preparation carefully, with the view of ascertaining the precise situation of the lumbrici in the liver, and it appeared that they were confined to the vessels of the vena portæ.

### CASE III.

January 1819.—Charlotte, a black, æt. 9 years, had all her life been a delicate child. Came from the country much emaciated, with face and lower extremities œdematous. She had brought up several lumbrici before she came to town. Calomel was prescribed, to bring off the worms, and cordials to support the strength. She vomited 100 large lumbrici, some of them upwards of 10 inches long, between the 2d and the 22d of January, the day on which she died.

*Dissection.*—The dura mater adhered firmly to the cranium, and was in a state of great vascularity. There was a considerable quantity of coagulable lymph between the tunica arachnoidea and the pia mater. The substance of the brain was much softer than usual: The cerebellum hard. Much serum surrounded the medulla spinalis, and when the head was lowered, a quantity to the extent of  $5\frac{1}{2}$  oz. oozed out.

The lungs were highly vascular, and generally adhering to the pleura costalis, and collapsed. On passing the hand over the lower parts of the ribs, and superior portion of the diaphragm, it gave the sensation as if passing over carious bone. On more



minute examination, this was found to be produced by small bony substances about the size of millet-seeds.

The pericardium was full of water; the heart enlarged, and much more soft and flaccid than natural; the coronary vessels enlarged.

The peritoneum was in a state of high inflammation. About 6 oz. of fluid in the abdominal cavity. The mesenteric glands were much enlarged. The spleen, kidneys, and bladder highly vascular. The internal coats of the stomach and bowels were much inflamed, and several parts of the ilium and jejunum were studded with gangrenous spots. The stomach and bowels contained 90 lumbrici. The liver appeared much collapsed, and adhered to the diaphragm and ribs. On examination, it felt hard and scirrhus externally. On cutting it, the hard surfaces proved to be large lumbrici, coiled in its substance; 5 were removed, the remaining 11 are left in the preparation. It will be observed, that the worms passed before death, and those contained in the stomach, bowels and liver, *post mortem*, amount in all to 206 in number.

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The 4th Case is a case of great enlargement, suppuration, and ulceration of the liver, in a child aged 12 months.

## CASE IV.

June 1817.—Jennetta, a child negress, æt. 12 months, has been subject to a diarrhoea for two months; with worms, several of which she has passed; and the occasional appearance of bloody stools. Her mother died when she was 4 months old, since which time she has been brought up on spoon-meat. Although I had occasionally seen the child, yet not suspecting any affection of the liver in so young a patient, I did not think of examining the abdomen attentively till the day before her death, when, to my astonishment, I found the liver much enlarged and hard; the margin extending down as low as the umbilicus. The body generally was much emaciated.

*Dissection.*—On exposing the abdominal cavity, the first morbid appearance that attracted notice was the peritoneum adhering firmly to the scrobiculis cordis. On the surface of the liver, in the right, and still more, in the left lobe, deep ulceration, about the size of a dollar, was next observed. The right lobe, immediately under the margin of the ribs, was much inflamed, and was the seat of an abscess, containing about 3 oz. of a bloody matter, rather thin in consistence. The stomach, bowels, and other viscera, were sound.

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The *5th Case* is regarded by Mr Brown as unique. Many large sarcomatous tumors were found in the abdomen and thorax, more or less connected with the viscera. Six or eight connected with the abdominal viscera were sent to the Museum. The largest measures 16 inches in circumference, and weighs about 22 ounces. The short history of the case is translated from a letter of the French Medical attendant, addressed to Mr Brown. Mr Brown was himself present at the dissection.

## CASE V.

1815.—Negro Felix, in the month of June, was seized with pain in the right shoulder, extending down the side, which was exceedingly violent for 24 hours. It subsided gradually, and by the fourth day had nearly disappeared. Some days thereafter swelling of the abdomen appeared, particularly in the hypogastric region. His appetite failed, and a total disgust for food succeeded. He took but one meal a-day, and this was followed by great increase of the swelling. Emaciation rapidly supervened. In the beginning of September, the abdomen being much swollen, he was tapped, and after the water was evacuated, large hard masses were felt in every part of the abdomen.

*Dissection* was performed on the 28th October 1815. The water was first drawn off from the ab-

domen, and many indurated substances were felt floating within the cavity. On opening the abdomen, the tumors were found extensively distributed amongst the viscera. The omentum was nearly obliterated, but had some large tumors in its folds. Others were connected with the spleen, stomach, arch of the colon, and mesentery, and extended from one side of the abdomen to the other. Others, but of a smaller size, dipt down along the rectum; and some were afterwards found on the pericardium and lungs. The tumors were irregular in shape; firm and fleshy in consistence, and of a cineritious colour. The structure of the liver was much changed, and had an appearance nearly resembling the floating tumors. This viscus extended into the left hypochondrium. The bloodvessels of the mesentery were much enlarged. A sac, containing coagulated blood, was attached to the stomach. The spleen, kidneys, and remaining viscera, were otherwise sound.

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The last case to which I have to call the attention of the Society, is one bearing more upon Physiology than Pathology. It is one of those cases in which the skin of the negro is changed from its natural black to a white colour.

Cases of this description appear to be very uncommon. Of the six cases, which, so far as I know, are all that have been recorded, three occurred in childhood.

Dr Pritchard speaks of the one which he saw in Demerara as one of the most remarkable natural curiosities in the colony, or perhaps in the West Indies. (Notes on the West Indies, Letter 29th.) It occurred in a female, aged 30, in perfect health, without any apparent cause. The change had been six years in progress, and was far from complete.

## CASE VI.

10th April 1819.—Samuel Herd, æt. 50, had an operation performed on him in January 1818, from which he perfectly recovered. Many months afterwards, he came asking for something for his skin, as it was becoming white, and the other negroes, he stated, laughed at him. His bodily health was excellent; and he was peculiarly free from asthma, to which he had been subject. States, that after the operation, and the healing of the parts, the cicatrix remained white; and much about the same time other parts became white also, especially the hands and feet. The whitening began on the back of the hand, and gradually extended up the fore-arm, till now it is nearly all white. The same process is going on in the lower extremities. The feet, legs, thighs and hips, are now almost all white. Some white spots show themselves on the back and shoulders, and about half the breast is of the same colour. A broad white ring surrounds the penis, and a considerable part of the scrotum is affected.

16th June.—The change is still going on. There is now a large white spot on the lower part of the

abdomen, and half the penis has changed colour. The head, too, is now nearly white, and is seen shining through the dark curly hair. Has still occasional paroxysms of asthma.

10th September.—Change still making progress, but not so rapidly as at first. His skin is acquiring a more natural appearance; on comparing his hand with that of a white somewhat sun-burnt, you could not distinguish it. Is still enjoying perfect health.

May 1820.—Since last report the progress of the change has been very obvious. The lower extremities, including the nates, almost of a natural white, with the exception of some patches of a bluish tint. The hands, and arms as high as the deltoid, entirely white. The skin on the shoulders and breasts of a pale ash-colour. The head completely white, and discernible at a distance through the black woolly hair. The ears, eye-lids, and skin round the eyes, the forehead, and *alæ nasi*, changing very fast. The lips of a particularly bright vermilion-colour. The breast, abdomen, and back speckled. The skin on the back which has not changed, is black and shining.

September 22d.—Continues to change, and every day appears to make an alteration. The extremities are now of a natural white appearance.

CASE  
OF  
PURPURA HÆMORRHAGICA.

By EBENEZER GAIRDNER, M. D. Fellow of the Royal College of Physicians, and one of the Physicians to the Royal Dispensary.

*(Read 30th July 1823.)*

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**J**AMES STODDART, æt. 6., the child of parents in comfortable circumstances, residing in a confined part of the town, is of a weak and strumous constitution, though quick and lively. The other children are healthy and robust.

The parents reported, that he had been lately much confined to school, which might account for a swelling of the glands of the neck, and a slight inflammatory affection of the eyes.

On the 24th, and two succeeding days, of April last, he was observed to be particularly unwell, being dull, with an inclination to sit over the fire, and having thirst, with flushed face. On Sunday morning, the 27th, spots, like flea-bites, appeared over a great part of his skin, and soon increased considerably; some were small and red, others, which were the largest, were purple. On Monday, blood

oozed from the mouth, with occasional bloody sputa. On Tuesday morning the urine became of a reddish colour, and turbid; notwithstanding, he was walking about occasionally, and unwilling to be in bed. On the forenoon of this day he accompanied his father, and walked a distance of at least a mile and a half for medical aid.

It was on Thursday afternoon, the 1st May, that I first saw the patient. The appearance, and other symptoms, as above described by the parents, very distinctly marked the *Purpura hæmorrhagica* of Willan. The petechiæ, with vibices and ecchymoses, were numerous over the whole body, particularly crowded on the upper part of the back, breast, and anterior part of both thighs; some of the latter, about the size of a sixpence, of irregular shapes, appearing in colour of as deep a shade as claret; some of them felt somewhat rough, but not at all elevated. By repeated and careful examination, through a glass of considerable power, the texture of the cuticle appeared to be quite entire. The conjunctiva of the right eye was completely ecchymosed, with little or no œdema or lippituda; neither was there diminution of sight nor pain: the tongue was rather dry, and covered with several petechiæ; there was thirst; the gums were redder than usual, very tender, and blood oozed from them, but they were neither soft nor swelled; his breath was extremely fetid; hæmatemesis was reported to be occasionally present; the Schneiderean membrane was streaked with blood, and occasionally bled. There was a ful-



ness, with pain on pressure in both hypochondria, particularly in the left; there was also obscure pain in the abdomen, which was rather tumid; bowels costive; urine free, and often passed during sleep, it was of a dark red colour and turbid; pulse quick and sharp; heat of skin not much increased; he seemed but little oppressed, being attentive and ready in answering the questions put to him, and expressing curiosity to know what the marks on his skin were.

I ordered the immediate exhibition of a saline cathartic, and fifteen drops of the diluted sulphuric acid, to be taken thrice a-day; also the tepid bath of about 80° Fahr. evening and morning.

May 2d.—Had taken the medicine, and used the bath; some sleep was obtained, but he had a bad night; there was considerable oppression and quickness of breathing; the hæmorrhagic symptoms had increased, with more petechiæ and vibices; pulse 110 and wiry, skin hot and dry.

I immediately bled him; he was sitting on his father's lap during the operation, which he stood well and with courage, until the blood had freely flowed to the extent of about  $\bar{3}x.$ , when he became suddenly sickly and vomited; no blood in the egesta, though he had spit clots of it frequently during the night, and immediately afterwards he passed a copious stool, both formed and loose, of a motley appearance. It was almost impossible to stop, by the most careful means, the discharge of blood from the wound, and, notwithstanding the utmost attention, quantities were

lost, from time to time afterwards, which could not be estimated. Thus, on my return at four o'clock P. M. I found there had been some discharge of blood from the arm. Notwithstanding the loss of blood, the pulse was now 124 and wiry; skin hot. In the evening he was drowsy, and slept quietly from half past five till nine o'clock.

The tepid bath was ordered to be continued, also the sulphuric acid drops; and as a cathartic, for the next morning, powders consisting of calomel and jalap, 3 grains each; to be repeated every three hours until a full effect was produced.

On the 3d, I found blood still oozing from the arm, the wound shewing no disposition to close; several of the vibices were considerably enlarged. There was less oppression, and the breathing easier; the ecchymosis of the eye diminished; the pulse, though quick and sharp, less so than yesterday afternoon; tongue cleaner and more moist; on its surface dimples were felt by the finger, where the petechiæ appeared; little thirst; urinary and alvine discharges nearly as before. The acid drops and the powders, with the tepid bath, were continued.

On the 4th, the pulse was more firm, and 124. There was pain under the os frontis; ecchymosis of the eye greater; and in both hypochondria the pain was increased, with very considerable tension. I again determined on another bleeding, and loosened the bandage from the arm. The part under the compress had become ecchymosed, without swelling. The wound was still open; at first the blood oozed out, and soon flowed, but not very freely, as the pa-

tient became faint at the dread of my again using the lancet, so that only two or three ounces were obtained. However, on my return in the evening, I found that there had been some drainage of blood. He was now in a quiet and sound sleep; pulse, as in the morning, 124; skin not very hot, rather soft; he had been calling for food in the course of the day.

5th.—During the night, and while asleep, he had passed a good deal of urine; also since he awoke. There was now a remarkable change in the appearance of this secretion, it having become pale and limpid. Pulse 102, and moderate; heat moderate; tongue clean and moist; gums better, but still tender, and during the night there had been oozing of blood from them. He had taken a little light nourishment with some relish. Bowels opened by the powders, but this discharge was also in its turn considerably changed in appearance, being very black, and excessively offensive. There was besides some increase of pain, with tension, in the abdomen, and in both hypochondria, but still most in the left. Fomentations, and castor-oil in small doses, were ordered to be immediately administered. This pain increased towards the afternoon, and he moaned very much; while there were several copious stools of the same grumous character as in the morning. At 4 o'clock I found him much distressed, as if nature were inadequate for the further effort that seemed necessary to overcome the disease. A mixture of port wine and water, a pound of each, with an ounce of cinchona infused into it, was frequently

exhibited in small doses ; while the discharge from the bowels was encouraged by the due use of castor-oil.—8 o'clock, P. M. He had passed more black fæces ; but the pain was less, and he was now asleep. Continue the bark infusion, and the acid drops.

6th.—10 A. M. Had a good night ; little or none of the bark infusion had been taken since last night. A laxative powder was given this morning, as he refused the oil ; bowels continued to discharge the same kind of black fæces, with less pain. Tongue pretty natural and moist. He had taken some breakfast. Gums also better, and no oozing nor spitting of blood. Pulse 98, and moderate. Skin of natural temperature ; some of the petechiæ and vibices appeared as if they were somewhat faded in colour, while others were brownish. Eye much better. Continued the acid drops, and the castor-oil as the bowels might require it ; also the bark infusion.—9 o'clock P. M. Much black fæces continued to be discharged with little pain ; there was now, however, an accession of heat, with a quickening of the pulse, so that the bark infusion was intermitted\* ; the acid drops and tepid baths continued, and a laxative powder ordered to be given early next morning, which had the desired effect.

On the 7th, symptoms favourable. Fæces, though still black, less fœtid.

On the 8th the fæces became of a natural appearance ; the petechiæ began to fade, the cuticle re-

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\* Upon the whole, not above one-half of the quantity of the mixture (say  $\frac{1}{2}$  lb. of wine, and  $\frac{1}{3}$  ℥ of the bark) had been taken, as he disliked it very much.

remaining quite entire. Pulse 96, not weak. Appetite improving, greater than usual.

10th.—In a state of convalescence, going about the house. The marks of the skin very pale; and the only other symptom remaining was that of the breath being very foetid, which went off a few days afterwards, by the due use of cathartics.

On the 14th he was out airing, and two days afterwards was running about, and remarked by the parents to be apparently in better health than he had been before the accession of the present complaint.

I intended to have had both the blood and the urine analysed; but it is to be regretted that the blood drawn on the 2d May, the only opportunity which was afforded of obtaining it in any quantity, was not preserved. I may state, however, that what was first discharged by the lancet, and received into cups, seemed, four hours after it was drawn, to coagulate very imperfectly all in one mass. On the following day, it resembled a tremulous jelly, the top of which was of a greenish buff colour, interspersed with brownish spots, like tadpoles. What was afterwards discharged, had, as it came from the arm, more the appearance and consistence of turbid lymph, or fluid in which some reddish colouring matter was in suspension; and the cloths taken from the arm did not present the usual stain of blood, but something like those of dirty water, interspersed with large stains of a reddish-brown colour.

Notwithstanding what has been remarked of the appearance and consistence of the blood, in the cases of *Purpura hæmorrhagica*, that have of late years been published, as to its *tenuity*, the *buffy coat*, and the alleged reduced quantity of the *fibrine*, I do not find that due notice has been taken of a peculiarity, which appears also to be pretty general, namely, that the serum by rest undergoes a slow but spontaneous coagulation. Indeed, the change which the blood seems to suffer, appears to me such as to render it desirable to obtain an analysis of this fluid while the disease is at its height; how important soever it may be to note and investigate, at the same time, the state of the extreme vessels, which seem also to be affected.

Specimens of the urine that was passed on the 2d May, were sent to my friend Mr Murray, who, in the most obliging manner, had offered to undertake the analysis, and whose able report I have the satisfaction to subjoin.

*Mr MURRAY'S Analysis of the Urine.*

No. I., voided on 2d May, at half-past 2 o'clock P. M., was of a brown colour, without smell. On standing, it deposited a precipitate of a darker colour, while the superior part of the fluid was of a dirty pale yellow colour, and turbid. When the urine was shaken, it resumed the original brown appearance; and a portion of it that was set aside, after eighteen hours standing, was still without smell.

- Exper. 1. Litmus paper was stained slightly red.
2. A dense white coagulum was produced by a heat of 180°.
  3. Diluted nitric acid and alcohol produced a similar coagulum.
  4. Corrosive muriate of mercury caused an abundant white precipitate.
  5. Lime-water produced a very slight precipitate.
  6. Potash did not cause any precipitate.
  7. One fluid drachm contained  $2\frac{1}{2}$  grains of solid matter; the urine contained  $\frac{1}{24}$ th part of solid contents.
  8. A slight precipitate was produced in the clear liquid by the corrosive muriate and infusion of gall.
  9. The clear liquid contained a considerable portion of a colouring matter, and but a small quantity of phosphoric salts, with no urea.

Nos. II. and III., voided at 5 and half-past 5 o'clock P. M. of 2d May, differed principally from No. I. in containing more free acid and less albuminous matter, the urine containing only  $\frac{1}{27}$ th part of solid contents.

In the 8th experiment, the precipitate was rather more copious, indicating the presence of gelatine and mucus.

In the 9th experiment also, the appearances were rather more distinct.

Dr Combe has shewn, in his case of Purpura \*, that there was an excess of albumen, with a defi-

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\* Edin. Med. Journ, No, 66;

ciency of urea, similar somewhat, in this respect, to the present case.

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*Mr Wood's Case of fatal Purpura.*

The following very interesting case of fatal purpura was communicated by Mr William Wood, at one of the meetings of the Society, and is extracted from the Minutes, as noted at the time.

The patient, æt. 12., an inmate in one of our Girls' Hospitals, was of a scrofulous constitution, having a chronic disease in her left wrist, although otherwise in good health and spirits.

On Saturday, June 21. a spot was observed on her under lip, as if she had been putting her pen into her mouth; and she was desired to wash it off.

Next morning, spots of a similar character, were observed thickly studded over her legs, and also a considerable number on her arms; otherwise she was in perfect health, and made no complaint. She was brought over to Mr Wood's house, (about a mile's distance,) and walked with perfect ease. She was amused with the idea of being regarded as a patient. Some opening medicine was prescribed.

Mr W. saw her in her own apartment during the course of the next forenoon. She was sitting up, and unconscious of ailment. The appearances were much the same. The pulse was good, and there was no heat of skin. She was sitting by the fire to warm herself; she was ordered to bed. Salts were prescribed.



About 10 at night, she called for supper, saying, she could not sleep without it. She had been on spare diet, and was allowed some milk and bread.

Shortly after this she went to the water-closet; and again betwixt 3 and 4 A. M. On the latter occasion she felt very faint and giddy, and required assistance in returning to bed. She was now seized with vomiting, and complained of a very severe pain in the right temple. The sickness was most distressing; and when raised up vomiting supervened; what she vomited was tinged with blood; and it was observed that her gums were readily excited to bleed.

Great languor and exhaustion rapidly supervened, to such a degree, as to excite alarm of her immediate dissolution. Mr W. saw her betwixt 7 and 8 in the morning (Tuesday), and found her in the lowest state of depression, very sick, with great tendency to vomit, and scarcely any pulse. At noon he found her labouring under all the symptoms of oppressed brain. She continued comatose till 3 P. M., at which hour she died.

*On Dissection.*—The appearance of the surface was as before described. The pericranium was covered with petechial spots, as was the dura mater. On removing the membrane, the effects of large effusion of blood were exhibited. In the right tem-  
plar region, a firm coagulum, floating in bloody serum, had forced its way through the broken-down brain into the ventricle. The serous membranes in the cavity, both of the chest and abdomen, were found, like the dura mater, studded throughout with dark livid spots.

ON THE  
NATURE AND ORIGIN  
OF  
TUBERCULAR DISEASES.

By JOHN ABERCROMBIE, M. D. Fellow of the Royal  
College of Physicians,—Vice-President.

*(Read 13th August 1823.)*

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**I**N connexion with a very interesting paper, lately read to the Society by Dr Alison, I beg leave to submit to them a brief outline of some experiments on the nature of Tubercles, premising, however, that they are at present to be considered as nothing more than hints for farther investigation.

In the tubercular masses which we find in the lungs, we observe a considerable variety of structure. The most abundant is generally the firm, white, opaque matter, but we often find it interspersed with nodules of a flesh colour, and sometimes with others of a semi-transparent appearance, like soft cartilage. Other appearances have been described by late writers, but these seem to be the most remarkable; and they differ, besides, in different cases, by being, in some cases, encysted, in others, forming irregular masses,

not encysted. As they are presented to us in the lungs, we generally find the masses so destroyed by ulceration, that it is almost impossible to separate the different structures from each other, but we have every reason to believe that the tubercular disease of the mesenteric and lymphatic glands is strictly analogous in its nature, and in these we have better opportunities of observing it in its different states, and different stages of its progress.

In their first state of simple enlargement these glands present, when cut into, a pale flesh colour, and a uniform soft fleshy texture. As the disease advances the texture becomes firmer, and the colour rather paler. In what may be considered as the next stage, we observe portions that have lost the flesh colour, and have acquired a kind of semitransparency, and a texture approaching to that of soft cartilage. While these changes are going on, we generally observe, in other specimens, the commencement of the opaque white structure, which seems to be the last step in these morbid changes, and is strictly analogous, in its appearance and properties, to the white tubercle of the lungs. In a mass of considerable size we can sometimes observe all these structures, often in alternate strata; some of the strata being composed of the opaque white matter, others presenting the semipellucid appearance, while in other parts of the same mass we find portions which retain the fleshy appearance. In the most advanced stage, the opaque white, or ash coloured, tubercular matter is the most abundant, and this af-

terwards appears to be gradually softened, until it degenerates into the soft cheesy matter, or ill conditioned suppuration, so familiar to us in affections of this nature.

A chemical examination of the glands in these various states of disease, presents some curious results. When a gland in the first state of enlargement, presenting the soft fleshy appearance, is plunged into boiling water, it instantly contracts considerably in its dimensions, its texture becomes much firmer, and the colour changes from the flesh colour to an opaque white, or ash colour. By boiling for a short time, it loses a great part of its weight, but a residuum is left, which has increased much in firmness during the boiling, has lost entirely the flesh colour, and exhibits the appearance, consistence and properties, of coagulated albumen. The part that is lost seems to consist partly of water, but chiefly of the muco-extractive matter; sometimes, but not always, there is a mixture of gelatine, and in some specimens the coagulated part gave traces of fibrine, but in small quantity.

The proportions of these ingredients varied exceedingly in different specimens, and apparently in different periods of the disease. In the softest state in which I had occasion to examine glands considerably enlarged, they lost, by boiling, about five-sixths of their weight, the remaining part, or one-sixth, being a firm mass, with the appearance of the firm white tubercle, and the properties of coagulated albumen. Glands, examined in what appeared to be

a more advanced period of the disease, lost by boiling a smaller proportion, perhaps from two-thirds to a half. Portions in the semi-transparent cartilaginous state, lost about a fourth, leaving three-fourths of their weight in the same state of firm opake albuminous coagulum. The white opake tubercular matter lost a still smaller proportion, perhaps a sixth, and when this could be procured in its dense and uniform state, and detached from any mixture of the other structures, portions could be found which scarcely lost any thing in boiling, but seemed to consist almost entirely of a firm white substance, with all the properties of coagulated albumen. The specimens examined in these last experiments exhibited the usual appearance of the white, or ash-coloured tubercle, and the same results were obtained from an examination of the white tubercle of the lungs, the tubercular disease of the bronchial glands, from tubercles of the liver, certain tumors of the brain, and from similar diseased masses found in other situations. In one case, I found in the brain a cyst containing albumen in a transparent gelatinous state, but which coagulated by heat into a firm solid mass. It is not easy to ascertain the properties of the mesenteric or lymphatic glands, in their healthy state, on account of the smallness of their size; but in some of the smallest that I could distinctly separate, and which appeared to be very little removed from the healthy state, I did not discover any trace of albumen. They were nearly soluble in boiling wa-

ter, leaving only a small residuum of a brownish friable matter, which crumbled when rubbed between the fingers. The dissolved part consisted chiefly of gelatine.

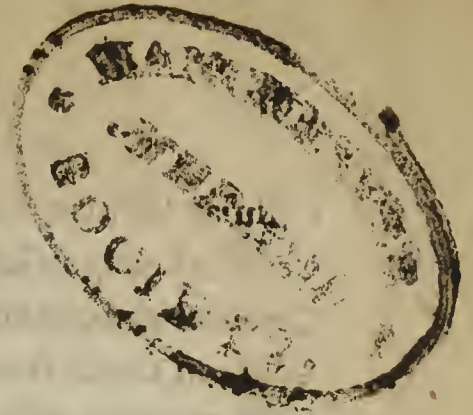
The deposition of albumen, therefore, in these glands, appears to be a process of disease. In the early stages of the disease, it seems to be deposited in a soft state, and to be involved in the structure of the gland; the gland in other respects being vascular and organized, and probably capable of performing its functions. It is in this state that we see the albumen coagulated when the gland is plunged into boiling water, producing so immediate and remarkable a change in its appearance and texture. As the disease advances, the proportion of albumen seems to increase, while at the same time it assumes a more concrete state, and the mass in general becomes less vascular and less organized. In the last stage, the vascular structure of the gland seems more and more to disappear, until it passes into a mass presenting the properties of coagulated albumen, with little or no organization. In the former stages, it is probable that the part remains susceptible of active inflammation, and healthy suppuration, or suppuration deviating in a greater or less degree from the healthy character. In the latter stages, it appears to be unsusceptible of healthy action, and to pass only into that peculiar state of softening which arises from the decomposition of the tubercular matter.

There seems, then, to be some ground for the conjecture, that this deposition of albumen is the origin

of tubercular disease. It is in the mesenteric and lymphatic glands that we have the best opportunities of marking its progress ; but betwixt the various stages of the disease in them, and the various forms of tubercular disease of the lungs, there is the most close and remarkable analogy. In the bronchial glands, we observe the same form of disease, and according to Portal and other writers of the first authority, glands similar to these exist in very great numbers throughout the whole structure of the lungs, being found at every division of the bronchiæ, however minute. If this be the case, they must pervade every part of the pulmonary substance in such numbers, as would readily account for the usual appearances of tubercular lungs, on the supposition that this disease is seated in this glandular structure. For even the larger glands which we find at the bifurcation of the trachæa, are very small bodies in their healthy state, while in the state of tubercular disease, they may acquire the magnitude of eggs, or even a still larger size. I do not however contend, that tubercular disease is necessarily confined to a glandular structure. On the contrary, there seems every reason to believe, that the peculiar deposition which constitutes it may take place from any tissue of the body ; in some cases slowly and gradually, in others, as the result of a low inflammatory action of a peculiarly unhealthy character. On this curious subject much remains to be done by observation and experiment, particularly in regard to the characters of the deposition from scrofulous inflammation, compared with the deposition from active inflammation.

in a sound constitution ; likewise in regard to the characters of tubercular disease, as arising from various tissues of the body. The tuberculated disease of the peritoneum, on which so much has been founded by Dr Baron, presented, in my experiments, characters considerably different from the tubercles of the lungs, or the tubercular disease of lymphatic glands. The specimens presented an irregular surface, elevated into variously shaped nodules of a semipellucid appearance, and firm texture. By boiling in water these nodules were nearly dissolved, leaving only a small central part to which they seemed to have been attached, and which had undergone little or no change during the first boiling. The part that was dissolved seemed to consist entirely of the muco-extractive matter, and the part that remained appeared on farther examination to be the same substance in a more concrete state, with a small trace of albumen. What changes this substance undergoes in the further stages of its progress, I have had no opportunity of ascertaining. In all the specimens that I have had an opportunity of examining, it presented characters remarkably different from those of the proper tubercle. It is unnecessary to add how much they both differ from the contents of an hydatid, which appear to consist of water, holding in solution about  $\frac{1}{100}$ th part of saline matter, and  $\frac{1}{40}$ th part of animal matter of the nature of the muco-extractive, and that much evidence will be required before we are ready to receive the hypothesis of Dr Baron, that hydatids are converted into tubercles.





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## EXPLANATION OF PLATES.

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### PLATE I.

Fig. 1. is an exact copy of Dr Gordon's original sketch of the manner in which the hemispheres of the brain were united anteriorly, as described in page 211. The parts are represented of their natural size.

Fig. 2. represents the size and figure of the open internal surface of the right lateral ventricle covered with epithelium; *a* anterior cornu, *b* posterior cornu.

Fig. 3. is copied from Tiedmann, Plate I. fig. 8., and exhibits the brain of a foetus in the third month, with the hemispheres separated, to shew the open ventricles.

Fig. 4. is also copied from Tiedmann, Plate IV. fig. 4. It represents the form of the floor of right lateral ventricle in a foetus of twenty-one weeks, as exposed by a horizontal section. It is introduced to shew the general similarity of form to that of the right ventricle in the present case, Fig. 2.

### PLATE II.

*a*, The pericardium held up by pins, p. 258.

*b*, Part of internal surface of the aorta, with the surface of one of the coronary arteries.

*c*, The left auricle.

*dd*, The left ventricle, crossed by a probe placed under the columnæ carneæ and cordæ tendineæ.

- e*, A part of the right ventricle, with the sides separated by a piece of whalebone.
- f*, The remaining part of the right ventricle. To this portion the pulmonary artery remained attached.
- g*, A probe passed through the oval opening between the two ventricles.
- h*, The passage from the left ventricle into the right auricle, which was as large as the left auricular orifice.
- kk*, The parietes of the left ventricle.

### PLATE III.

This Plate represents the stomach of an infant, with its internal membrane eroded, as described in Dr Gairdner's paper, (pages 322, 323.)

The stomach was slit open from the cardia to the pylorus, and then everted, so as to shew the state of the villous coat.

A, Indicates the situation of the cardia.

B, That of the pylorus.

C, That of the splenic extremity or fundus of the stomach.

The *posterior* part of the stomach, on which the erosion is situated, appears *anterior*, in consequence of the eversion. A considerable portion of the villous coat is so completely destroyed, as to shew the fibres of the muscular coat. The extreme delicacy of these fibres rendered the representation of them very difficult. The author has much pleasure in acknowledging the valuable aid he has received on this occasion from the elegant and practised pencil of Mr Greville.

The erosion in this case was in all probability purely the effect of the gastric fluid, without any prior disease of the eroded part.



## PLATE IV.

Fig. 1. represents the diseased portion of Pia Mater described in Dr Alison's paper on Scrofulous Diseases, p, 419. Case 4.

- a*, The diffused effusion of lymph, lying chiefly over the course of a large vessel.
- b*, The ulcerated spot, which communicated with the broken down portion of brain.
- c*, Effusion intermediate between the diffused and tubercular form.
- dd*, Effusion wholly tubercular.

Fig. 2. represents a portion of the diseased lung described in p. 428, Case 8.

- a*, Vesicles beneath the pleura, filled partly with air, and partly with tubercular matter.
- bb*, The same appearance, in sections of the lung. The tubercular matter is partly disposed as a lining to the inside of the cavities, partly in irregular masses in their interior.
- cc*, Tubercles apparently formed by the filling up of these cavities.

FINIS.



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PLATE III







*Fig. 1.*



*Fig. 2.*

