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OBSERVATIONS UPON INJURIES OF THE HEAD.*

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PART II.

OF SYMPTOMS AND PRINCIPLES TO BE OBSERVED IN TREATING HEAD INJURY.

It is an old observation, that the heart's action is, to a certain extent, independent of the brain, and we know that this is borne out by experiment. If a living animal be pithed by dividing the spinal cord next its junction with the tuber annulare, the contraction and dilatation of the heart will for a time continue as before. It evinces a like capability of action when removed from the animal's body, and the phenomenon may be sustained both as to period and velocity, by raising the surrounding temperature, as by immersion in warm water. Still the whole affair is transitory, and the fact is not of much importance if stated as a ground upon which to base any practical suggestion; for the source of the nervous influence being cut off, so soon as the vital endowment of the part is exhausted, death ensues. We cannot maintain the supply of vital force so derived beyond a very brief space, or renew it when once expended; and therefore, whether we experiment upon animals, or reckon upon the resources of the system under injury, we must not count upon any encouragement which such an isolated phenomenon holds out. From the moment when the brain finally ceases, in consequence of interrupted connection to exert its influence over the rest of the body, the animal so circumstanced begins to die. I have never heard of any experiment or observation which invalidates the fact. The condition of the brain may be that of disease, and under such circumstances the system exhibits signs of its altered function, so long as its connection with the spinal marrow is preserved; but when the circulation in these organs is suspended, or their continuity is permanently interrupted, the process of dissolution commences, and is completed, sooner or later, according to the character and extent of the lesion.

Cases every now and then occur which furnish the apology for making a somewhat trite remark like the

foregoing. For example: people under treatment for local injury sometimes die suddenly, when all has been going on favourably for many days, and that crisis has been reached at which a new and urgent call is made upon the powers of life.* In other cases where a chronic disease of an important organ has gradually impaired the proper nutrition of the system, the energies of life have been seen suddenly to succumb, and the spark has been extinguished almost in a moment of time. Without any premonitory sign, the patient on a sudden complains of præcordial oppression; a sense of faintness supervenes, then restlessness; he gasps and tells you he is going to die; and in fact he does die, perhaps, upon the spot.

So long as the brain retains its integrity, a loss of consciousness and muscular power is not of fatal import; the person so circumstanced is not dead, but sleeps; but when that organ has undergone changes incompatible with the preservation of its office, we are informed of the fact through the medium of the circulation. Hence, in head injury, experience always regards, with a just apprehension, a flagging or uncertain pulse, or one which continues steadily doubled in its rate of frequency, independent of any other symptoms, strictly cerebral, which may happen to prevail at the time.

I will now briefly address myself to some particulars affecting the local and general management of head injury. If we compare the remarks of such clever observers as Dean and Pott with the practice of the present time, we shall be puzzled to explain what has become of a numerous class of cases, which in their day called for the continual "setting on of the trephine." They must still occur, and be even more frequent now than formerly; the fact is, that they are differently interpreted. Mr. Pott, with all deference be it said, for he was a scholar as well as a surgeon, mistook the road upon a false theory of "prevention." Mr. Dean fairly admits "that the people all died in spite of the trepan, physis, bleeding, and low diet, and that those who escaped the operation, or any treatment at all, often made the best recovery."

To be candid we must admit, that the principles of inflammation, the doctrines of constitutional power, and functional derangement, were very improperly under-

* For a very remarkable case of this kind *vide* the report of an inquest upon the body of Andrew Nelson Ruddock, Esq., surgeon, of Bristol, in the local journals, who died one month after simple fracture of the leg, on Friday, November 4th, 1842.

* Concluded from page 591.

stood, and not appreciated then as now, and that besides more exactness of observation and detail, we possess in the action of mercury a means of arresting inflammation, and restoring a disturbed balance of circulation, of which they knew nothing. To the surgical pathologists of our own day, and in an especial manner to those employed in watching the course of inflammatory changes in the transparent tissues of the eye, we are indebted for what may well be termed a discovery, first brought from the London Eye Infirmary, Charter-house Square, to the great hospitals, and since employed to prevent, modify, or remove adhesive deposit, as the case may be, and controul the various terminations of inflammation. Where, half a century ago, the lancet was indiscriminately used, or the knife, the saw, and the cold grinding cathartic constituted the treatment of a doubtful concussion, we now attach more confidence to the operation of small doses of calomel, at regular intervals, aided, as required, by the trickling bleeding procured from a score of leech bites.

Head injury is often remarkable for the great obscurity of its early symptoms, to say nothing of their variety. After the same kind and amount of violence one man is rendered stupid, and his pupils, whether dilated or not, are inactive; he is drowsy, sick, and moans when spoken to; his pulse is feeble and slow, and his surface chilled. Another is reduced to a condition of positive insensibility, casts his stomach at the time of the accident, but not afterwards; is very cold, has a large motionless pupil, a slow labouring pulse, not unfrequently snores loudly; one arm or side of the face may be paralyzed, along with the bladder and lower extremity; the urine may or may not be permanently retained. The continuance of such a condition is one among the symptoms of a recoverable state, or its opposite. Perhaps there is an appearance of blood about the nares, or it has trickled in small quantity from the meatus auditorius. A third, after a severe blow or fall upon the vertex, is excessively violent and incoherent, requiring restraint to keep him in bed; the pulse bounds; the surface is not cold; there is a fixed pupil, but an expression of wildness about the eyes. Now, although any one of these conditions may exist, irrespective of any lesion whatsoever, being any possible form of shock or recoverable commotion, it may be the forerunner of acute membranous inflammation, or of that hopeless train of symptoms which indicate lesion of the substance of the brain. There are many cases modified in their course and character by habits of intemperance or by a previous physical exhaustion, depraved secretions, or unfavourable mental conditions, which are from such causes additionally obscure under the effects of injury, so that it is as necessary to inform oneself of the previous habits and position of the patient, when summoned to such accidents, as it is where the disease is idiopathic or the symptoms of a more slow and insidious nature.

I always direct the head to be shaved; even where the mischief is slight it is a useful precaution. One sometimes discovers a wound or bruise by so doing which might otherwise have escaped detection for days, and it is a positive relief to the entire region, as well as neces-

sary to the efficient use of topical means. A spirit lotion, or a diluted Goulard wash, with the Liq. Ammon. Acetat., are amongst the best refrigerants commonly in use; but cold vinegar and water answers as well as any other application.

With regard to bleeding, abstraction of blood from the arm is of course at times indispensable, but often the slow oozing obtained by good leeches is not only more effective, but by far the safer practice. This more gradual operation of the depleting agent tells with great effect upon cases where the reaction is disposed to be tardy or incomplete. I have seen patients slowly open their eyes and recover consciousness, after trickling leech-bleedings, who had been previously bled copiously from the arm without any evident good effect; and I believe that if the heart is too rapidly impressed by venesection *pleno rivo*, along with faintness, there supervenes increased congestion and fresh loading of the sinuses. The respiration under such circumstances becomes more and more impeded, or a fresh fit of violence comes on—excitement without power. Put by your lancet in such a case, I should say, for you will probably kill your patient if you persevere. Watch especially the venous circulation; where the pulse will bear the pressure of the finger, order an application of six leeches to one or both temples, (I have laid them on one by one,) bathe the wounds so made with hot water and now look narrowly to the breathing, the countenance, and the pulse. The soft murmur of child-like repose slowly takes the place of the former retarded or irregular respiration; the face is no longer suffused, nor the features working and distressed; the lips are slightly compressed, which lately hung in a semi-paralyzed state, flapping, and loose; the pulse is now regular, 80° or 90° in the minute; the patient is reviving, and will reawaken to consciousness by-and-by, when the capillaries are sufficiently relieved, through the influence of a regular pulmonic circulation; the blood is now more decarbonized, and when the heart in its turn begins to respond to its accustomed stimulus, the reaction may be deemed complete, and the patient is restored by gradually unloading, instead of suddenly emptying, the oppressed vascular tissues. As for counter-irritants they are useful in most recoverable commotions of the brain, and their diffused action is at times very salutary. Where there exists an early tendency to excitement, they will sometimes control it in a remarkable manner—when active depletion fails, or is plainly inadmissible. They are especially operative in those morbid conditions where there seems to be a want of power to rouse and sustain the action of the capillaries. In recent head-injury it is best not to irritate by maintaining a raw surface, or keeping the blister open, as it is called. The relief to be obtained by counter-irritants in such a case is not to be confounded with the proceeding indicated in chronic disease. The soreness and irritation of an issue are very undesirable here, and the exhaustion so produced may be of serious consequence to a person otherwise disposed to early convalescence. The regions best adapted for these applications are the crown of the head and the nape of

the neck. The required irritation may be kept up for a period of six or twelve hours, according to circumstances. Blisters should never be used where there is reason to believe that the brain is lacerated, or irretrievably injured, and on such occasions no other objection need be advanced than this, viz., that they are utterly useless.

OF PURGATIVES AND THE USE OF MERCURY.

There is nothing more repugnant to a thinking mind than the very coarse and unreasonable practice of giving large and repeated doses of purgative medicine immediately after the occurrence of any severe accident, nor in head-injury is such a proceeding always free from danger to the life of the patient. However plain the indication for laxatives may be, the practitioner should bear in mind, that whether it be a broken leg or a broken head, he has ordinarily to do with complicated effects. If the previous diet has been poor, and the meals irregular both in quality and quantity, there will probably be unhealthy or defective secretions and loaded bowels, but for the same reason there will also have existed so much the less ability to resist the impression of severe shock or sudden violence. Such a consideration is strengthened by the fact, that in many cases the system is already debilitated by habits of intemperance, or slow organic changes may have commenced in the lining membrane of the stomach, or in the substance of the liver or kidneys, implying a necessity for extreme caution in the use of medicine of any kind. I am very sure that I have more than once seen convalescence retarded by a repetition of large doses of calomel, or the frequent use of Epsom salts, where the system could not bear such treatment. The rich and dainty, too, under similar circumstances, often require to be handled with equal caution, for that luxury and excess are more fatal in their enervating influence than a meagre and scanty diet, is proverbial. It is a common observation that we give ordinarily too much medicine, and I do believe that in surgical cases much of the physis might well be spared, or at least its intention be more certainly carried out by means of restricted and careful diet; nevertheless purgatives are by no means to be overlooked in the treatment of head-injury. Whenever stupor, nausea, with vertigo or bowel-pain, are complained of, a very early recourse must be had to laxatives at least. Castor oil or the compound senna draught should be given as soon as the patient is in circumstances to swallow and retain the medicine, but I have never been able to appreciate the necessity for an immediate exhibition of large doses of calomel in simple concussion. Slow bowels or obstinate constipation not unfrequently follow injuries of the head, and the biliary secretion is especially liable to defect or suppression, but such a state is not the production of a few hours, and some days elapse ordinarily before calomel need to be resorted to. When its use is indicated, it is better to give it in a full dose; but it is an old remark, that all mercurials have a tendency to lower the patient when too liberally administered, and this is not desirable when we wish to institute a process of repair, or

restore the powers of the system with certainty and expedition.

One reason why the older surgeons saw so many cases terminate in secondary and fatal inflammation of the membranes of the brain was, their inability to discern the stage and period of reaction, or, in other words, to determine the moment at which one or two decisive doses of calomel would often have prevented the necessity of more, and would have summarily stopped, if it did not anticipate those changes, which terminate in incurable effusion. In all the simple or less complicated cases, such an irritating medicine should be administered as will suffice to empty the loaded colon, and gently stimulate the alimentary canal. Healthy appetite, next to rest, is the surest and most unfailing sign of a return to health; it should be cherished and assisted, not destroyed, by the operation of medicine. Injections per anum are not often required in the early treatment of head injury; but if the stomach is irritable, or there is reason to suspect a loaded state of bowels, they may be administered with advantage. Some common salt stirred into a pint of thin gruel, or a warm senna infusion, holding some sulphate of magnesia in solution, or an ounce of turpentine mixed with a quart of warm water and the yolk of eggs, are among the best forms, and are generally productive of immediate relief to the distended abdomen.

I have endeavoured to draw a line of demarcation between those instances of disorder in which mercury is not essential to the recovery of the faculties, and others wherein one or two full and decisive doses pending the return of convalescence, are of marked utility, if not an urgent necessity. I have further ventured upon the suggestion, that calomel so exhibited should be given in a full dose, and not hindered in its proper effects by extraneous combination. This observation applies to the purely evanescent operation of this remedy. I shall now briefly allude to its value as a specific in cases of a more complicated or obscure character. It often happens after the lapse of a few days from the time of the mischief, that the patient remains in a very stupid condition, that he is with difficulty roused from his lethargy, and when taxed with enquiries, the expression or complaint is one of pain and uneasiness referred to the head generally. There is a great intolerance of light; the skin is dry and hot; if the patient can be induced to protrude the tongue, it is not simply loaded, but coated with a white sticky secretion. The bowels, perhaps, have been copiously relieved by purgatives or injections. There is ordinarily no evidence of any loss of command in the sphincters; but the patient will part with the contents of the rectum often undesignedly, like a newly-born child. Sometimes the lethargy is uninterrupted, as in the case of slow and retarded reaction; sometimes there is a state of moaning and extreme restlessness. If the patient does not refuse food, it is at least a matter of indifference to him. The pulse is, I believe, always accelerated in the case I am describing, and generally contracted—that is, quick and sharp. If there be contusion or wound, it must be narrowly looked to,

and the manual interference of the surgeon is sometimes called for before any medicine can be of service; but the symptoms, as regards the brain and its investments, are those of irritation and approaching inflammation. They are in contrast with the paralytic stupor of compression on the one hand, or the irregular and automatic movements of laceration on the other. To say where the congestion of irritation ends and inflammation commences is especially difficult in the case of the brain. The two states are allied, so much so, that we might almost regard them as stages of the same disorder. Be this as it may, these are the cases, as a class, in which mercury will effect the greatest good, and it is the only remedy which will dissolve the mystery of doubtful emergencies. If a patient under the prolonged effect of a severe blow or fall followed by insensibility, without breach of the integument or cranium, as far as can be known, does not mend permanently and decidedly under the action of mercury pushed to a gentle ptyalism, all other means having failed, the case is ordinarily fatal, and the patient dies. Sometimes a rapid act of inflammation has passed the limit of relief before this only effectual remedy is employed, and its termination is evidenced by characteristic appearances after death, or the brain may have suffered from one of those lesions, whether central or superficial, which proves destruction, not by reason of its extent, but because the business of repair cannot be accomplished. Irreparable injury, however minute, operates directly to exhaust the innervation which controls the circulation and function of organs subservient to life. The restorative action of mercury does not involve, as a necessity, so much rapidity of action as would entail great or sudden exhaustion, and it is to be accompanied by such local measures as tend to subdue inflammation. At first it is not desirable to exhibit opium; but if there be an irritable mucous surface, or the subject is aged, or if there be signs of organic change in other parts, it is then right to use it in combination with calomel, and with or without an antimonial, according to circumstances. Calomel in one or two-grain doses, at intervals of three, four, or six hours, is the best mode of giving mercury by the mouth. If deglutition is difficult or the patient is indisposed to unclothe the jaws, the mouth may be opened forcibly and the remedy in powder smeared upon the tongue with butter or other unctuous matter. This proceeding, upon frequent repetition, sometimes induces sore or excoriated fauces, and such irritation may become so painful as to be actually prejudicial. Under such circumstances, the mercurial ointment may be rubbed upon the skin so as to insure its speedy absorption. The effect of calomel, when once it has entered the system, is very marked in some cases of recoverable commotion. The copious and more regular relief of the bowels, the clear indications of returning sense and power conveyed by gesture and articulation, the disposition to take food, the compressible pulse and tranquil respiration, all point to the steady and progressive relief of the brain and its investments. There is still some complaint of pain, and

in bad cases, for a time, a paralytic condition of one of the nerves of sense—as smell or hearing—is observable, there is perhaps ptosis of one eyelid, an arm is benumbed, or one side of the body feels colder than its opposite; but these effects are transient, or at least may be permanently relieved if not entirely removed by careful after treatment.

This after treatment is a very comprehensive term. It includes attention to repose and diet, uniformity of temperature, and an entire abstinence from stimulants of all kinds, together with all provocatives to mental excitement. In certain cases of slow reaction some surgeons carry the principle of non-interference to a hazardous length. They affirm, that if the patient cannot sleep after the injury, medicine does little or no good. A proposition of this kind must be received with caution, but I am willing to admit that surgical or medical interference may be ill-timed, and to that extent very prejudicial in its results.

PART III.

OF IRRITATION AND INFLAMMATION: QUESTION OF OPERATION: APOPLECTIC CELL.

The action terminating in the formation of a circumscribed abscess in the substance of the brain is an inflammation, and the retained matter so produced, sets up an irritation of that organ. The angular depression or projecting spiculum of a cracked internal table of the skull produces irritation which, if it continue, provokes inflammation, evidenced by pain and febrile excitement during life, and by the appearances of thickening and effusion after death. It is of importance that the distinction no less than the connection between these two states of irritation and inflammation should be accurately recognised. If the subject of cerebral irritation be exposed to extreme measures of depletion, a fatal exhaustion may supervene, but they are wholly inadequate to relieve such a condition either in its cause or consequences. Surgeons of the present day have a deeper interest in the matter than their predecessors, from the knowledge of the operation of such an agent as mercury, which may well inspire them with confidence in the treatment of many cases not formerly remediable, and suggesting no alternative to the performance of an operation fraught with risk and extreme uncertainty.

The point at which irritation assumes the modified character of compression, is sometimes difficult of determination, but the symptoms which call for interference on the part of the surgeon seldom admit of doubt. We are not on these occasions to wait for laboured or sonorous breathing, a fixed pupil, and the course of direct pressure. Where there is a neuralgic or paralytic state of one or more members of the body, with slow and imperfect perception, impaired sense and memory, difficulty of speech and deglutition, atrophy or evidence of a permanently disturbed circulation, an operation is as plainly called for as though the local signs of compression were palpable to the sight and touch. Tenderness or pain on pressure, cir-

cumscribed and persistent, point to the site of such operation, whether it consists in simple division of the pericranium, or trepanning the skull. In these cases of the remote effects of injury, the presence of matter, bony spicula, diseased or necrosed bone with meningeal reparation, nay, sometimes even a slight thickening of membrane may give origin to symptoms which will usually be found to correspond in intensity to the amount of local change. In recent cases of fractured skull I believe the rule of not operating where there are no symptoms, to be a good one. A departure from this practice is certainly justifiable in the case of wound with fracture and depressed bone. Be the symptoms what they may, displaced and exposed fragments should be elevated if not removed. If left, they tend to provoke inflammation, which usually commences after the lapse of a few days and terminates in a destructive change with effusion on the surface of the dura mater. If removed at once, the patient being rid of such a grave cause of irritation before the parts are spoiled by disease, or rendered unfit to sustain a process of healthy repair, the system at large responds to the full extent of its powers, as yet unimpaired by medicine, and not debilitated by prolonged illness. The reverse of this is the result of waiting until signs of irritation arise. If inflammation of the brain or its membranes be not stopped at the outset, its fatal termination is seldom prevented. An irritation, on the contrary, need never be despaired of; whilst there is life there is hope. In either case the other organs of the body sympathise widely, and with variable effects, upon the constitution. The nervous power may be excited, depressed, or altered in its action, without immediate risk to the life of the individual, but the circulation, to maintain life, must be at once restored to its original freedom.

Chronic apoplectic lesion, though a purely local change, depreciates the quality of the nervous influence, but does not directly interrupt its course and operation; it is the crisis of a slow morbid action, of which the other organs of the body have all had warning, and for which they are in some degree prepared. This is not the case where the system has been taken by surprise by sudden lesion of a healthy structure. Laceration of the substance of the brain produced by injury is always fatal. In the first case, the powers of life having themselves undergone a previous diminution, are no longer capable of being very suddenly impressed by the occurrence of a minute lesion which, though critical, is but another stage or step in the progress of existing disease. Apoplectic cell therefore, unless it be large and rapidly formed, does not alarm the centres like a sudden tearing of the sound tissue. There is no immediate counter-action excited for purposes of limitation or repair; but the case is otherwise after recent injury. There the resistance and reaction commence at once and vehemently, though ineffectually, for the heart and arteries now no longer respond to the necessities of an organ, which under the circumstances they are unable to restore. As the connections of the brain are universal, it may be approached circuitously, as

well as by the direct road, and sometimes with more advantage where there exists a tendency to relapse. Symptoms can never be too closely watched, nor power too carefully estimated, in dealing with a part so prone to rapid and dangerous reaction.

44, Dover Street, Piccadilly,
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REMARKS, HISTORICAL AND PRACTICAL,

ON DISEASES OF INFANTS.*

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We have seen that towards the close of the last century, the subject of infantile diseases was beginning to engage the attention of eminent medical practitioners, and that considerable progress had been made in the knowledge of that department of medicine. But in the present century, both the interest in the study of the diseases of children, and the knowledge of their character and treatment, have increased in a ten-fold degree. Indeed, so many excellent works on the subject have made their appearance within the last 30 years, that it is difficult either to particularize them, or to point out their comparative merits and claims to the attention of practical men. It would be a needless waste of time to attempt to analyse the contents of each of these works, or even to point out the peculiar views of each writer. In our own country, besides the various editions of Underwood which have continued to emanate from the press, the works of Coley, Clarke, Joy, Copland, Davis, Bennett, Evanson and Maunsell, Willshire, West, &c.; and of Capuron, Billard, Gölis, Legendre, Guersent, Rilliet and Barthez, on the Continent, have contributed largely and satisfactorily to our stock of information upon the various subjects of which they treat. Dr. Bennett's treatise "On Hydrocephalus" ought to be read by all who desire to understand the nature of that unmanageable disease; and the work recently published by West, "On the Diseases of Children in General," well deserves an attentive perusal; but, for minuteness of description and profundity of research, the works of Billard, Rilliet and Barthez, have no parallel in this country. Billard's work was published in 1828, and has since gone through several editions. It is devoted entirely to the consideration of the diseases of new-born and nursing infants, and describes the development of the spinal marrow and brain, before entering upon the nature of the affections of the encephalon. The necessity of considering together the science of organization and the clinical observation of diseases, especially where the nervous centres are concerned, is a point in the pathology of new-born children which is frequently neglected or forgotten, notwithstanding the affections of early infancy must necessarily be greatly modified by the progressive