

The spleen is likewise found to act as a reservoir for blood when the circulation is obstructed as a consequence of impeded respiration. Experiment alone does not exhibit this result, for it is observed that diseases of certain organs, as the heart and liver, attended with obstruction to the circulation, are in all cases accompanied with enlargement of the spleen, and distension of its vessels.

From numerous analyses it was ascertained that the emerging blood of the spleen, as compared with the arterial blood entering the organ, and with the blood of the general venous and portal systems, presents the following peculiarities. It contains less solid matter than arterial or other venous blood, far less blood-globules, a considerable increase in the amount of albumen and fibrin, more fat, a variable amount of iron; and lastly, its serum presents in all cases a dark-reddish tinge.

An attentive study of the splenic pulp confirms the view of Kolliker, that the blood-corpuscles undergo disintegration in the spleen; and it is to this cause we must attribute the peculiarities of the splenic venous blood when compared with that which enters the organ.

After investigating the structure of the Malpighian corpuscles, and determining the laws which regulate their variation in size, the author considers that his results afford sufficient evidence of the glandular nature of these bodies, and of their close similarity in structure and function with the corpuscles of other ductless glands.

The last chapter of the work is on the physiology of the spleen; and in this the author enters into a consideration of the facts resulting from his labours, and concludes that the function of the spleen is to regulate the quantity and quality of the blood.

J. L.

ART. XVIII.—*Epilepsy and other Affections of the Nervous System which are marked by Tremor, Convulsion, or Spasm—their Pathology and Treatment.* By CHARLES BLAND RADCLIFFE, M. D., Licentiate of the Royal College of Physicians, Assistant Physician to the Westminster Hospital, Lecturer on Materia Medica and Therapeutics at the Westminster Hospital School of Medicine, etc. etc. London, 1854. 8vo. pp. 144.

THOSE of our readers who have had an opportunity of perusing Dr. Radcliffe's treatise on *The Philosophy of Vital Motion*, are aware that he has advanced a new and somewhat startling theory of muscular motion. That muscular contraction is a purely physical phenomenon dependent on ordinary molecular attraction when the muscle is *not* stimulated. That the real operation of nervous and other vital agencies, and of electricity and other physical forces, is not, as usually taught, to excite or stimulate contraction in muscle and other organic tissues, but to counteract this state, and induce relaxation or expansion. In other words, that all stimulants, vital and physical, so far from producing, on the contrary antagonize, muscular contraction, which occurs only upon the suspension or withdrawal of the action of the stimulants, in a manner perfectly analogous to that which takes place in a bar of metal when heat is withdrawn.

This physiological heresy, an exposition of which prefaces the proper subject of the essay before us, is enforced and illustrated by a series of arguments and illustrations of a most acute and plausible character, which cannot but arrest attention, even though they fail to carry conviction of the truth of Dr. Radcliffe's theory of vital motion.

Upon that theory is based, in the volume before us, the pathology and treatment of epilepsy, and other nervous affections marked by tremor, convulsion and spasm, as, the tremors of delicate and aged persons, chorea, paralysis agitans, delirium tremens, the rigor and subsultus of fever, the tremor of mercurial poisoning, the convulsions of fever, of hydrophobia, of saturnine and hydrocyanic acid poisoning, and those dependent upon the retention of urea

in the blood; the convulsions of cerebral disorder, of uterine disorder, and of intestinal disorder, and the convulsions of death; laryngeal spasm, cholera cramps, tetanus, ergotism, catalepsy, and rigor mortis.

Whatever estimate may be formed of Dr. Radcliffe's views of the nature and cause of muscular contraction and relaxation, and the correctness of the application of these views to explain the pathology of epilepsy and cognate affections, there can be little doubt that his theory of these diseases has a surer basis in truth—in many, at least, of its features—than that commonly received.

On an analysis of the leading phenomena of epilepsy, Dr. R. shows that neither the vascular, nervous, nor muscular systems present any indications of morbid excitation, but the reverse.

The condition of the skin, the state of the pulse, and the general diminution of the temperature of the surface, but especially of the extremities, indicate a very decided depression of the circulation. During the height of the fit, the state of the circulation is one of prostration, verging upon actual extinction.

The entire condition of the epileptic indicates the same want of activity in the nervous as in the vascular system. "The intellectual and memorial faculties fail day by day under the blight which eventually obliterates them. On the eve of the fit, the patient is rarely otherwise than silent, sad, moody, and still; in the fit, he is bereft of all sensibility, consciousness, and volition, and for some time afterwards he is stupid, confused, and exhausted."

"Arguing from the state of the pulse and the respiration in epilepsy, it would appear," Dr. R. remarks, "that the *medulla oblongata*, the *spinal cord*, and the *sympathetic ganglia* are in the same condition of inactivity as the brain. Nay, it cannot be otherwise, for the functional energy of these organs, as of the system generally, must be in direct relation to the activity of the circulatory and respiratory changes. It is to be observed, also, that that remarkable want of tone, which is a very marked peculiarity of the epileptic, is indicative of the want of energy in the spinal cord, if it be a function of this organ to supply this tone."

The depressed condition of the muscular system is evinced in the epileptic by the remarkable inadequacy to exertion; in the slowness with which the system rallies after fatigue, as well as in the pallid and soft condition of the muscles on dissection, which condition contrasts very strongly with the normal redness and consistency of these organs.

"Viewed in this manner," says Dr. R., "the vascular and nervous systems of the epileptic, as well as the mobile structures in which the convulsive phenomena are manifested, are seen to present unequivocal evidences of inactivity, and this inactivity—so far at least as the vascular and nervous systems are concerned—is found to be most marked in the fit itself."

The causes, or supposed causes, which operate in the induction of epilepsy are, according to Dr. R., all of a depressing nature.

"Thus," he remarks, "the seizure is referable, not to joy, but to fright and fear—not to any natural excitement, but to the exhaustion consequent upon excess and abuse—not to good cheer, but to hunger and privation. It happens at night, when the vivifying influence of the sun is withdrawn, rather than the day. Much obscurity hangs over these matters, from the careless manner in which the most incongruous agencies have been grouped together as exercising the same influence upon the system, and much obscurity is inevitable from the difficulty of untying the complex knot which holds together the several influences acting upon the body; but there is no reason to doubt, and every reason to believe, that these several causes of the fit are of an exhausting and not of an exciting character."

On a review of the foregoing facts and considerations, Dr. R. considers it to be sufficiently evident that—

"Epilepsy cannot be caused by any excitement of the muscles consequent upon the excessive supply of nervous or any other stimulus. On the contrary, everything is in harmony with the physiological premises, and, as might be anticipated from these premises, the convulsion would seem to depend upon want of vital stimulation, which want had allowed the molecular attraction of the muscles to come into play and gain the ascendancy."

Although we are not prepared to give our assent to the position which Dr. R. attempts to establish, namely, that all stimulants, vital and physical, in place of exciting or promoting, on the contrary antagonize muscular contraction, we nevertheless admit the correctness of his views in relation to the condition of the circulatory, nervous, and muscular systems in the epileptic—everything connected with the phenomena and progress of his morbid condition, evinces a diminution of vigor—of vital energy—a depression of their normal functions; each of these systems is in a condition of *under*, and not of *over activity*.

Dr. R. endeavours to show that the same depressed activity in the vital functions obtains in all the affections allied to epilepsy—those, namely, of which tremor, convulsion, or spasm constitute a prominent system. The evidence of depressed vital energy are in many of these affections sufficiently apparent, and even in those where the evidence is of a less striking character, it will not be found wanting, upon a careful analysis of the circumstances under which the convulsive or spasmodic phenomena present themselves, and the condition of the circulatory, nervous, and muscular systems preceding and attending them.

"The subjects of nervous trembling," Dr. R. remarks, "have a certain delicacy of constitution which cannot be overlooked, and if not women, they have the feminine habit of body in a very marked degree. Those who tremble from old age or from shaking palsy, present unequivocal marks of decrepitude and decay—the listless wish, the snowy or hairless head, the fireless countenance, the wasted limb, the feeble pulse. Chorea is almost peculiar to females, and to females whose parents were infirm or aged, or who themselves have become enfeebled by improper or injudicious habits. It often originates during some severe and exhausting disease, and is always accompanied by signs of debility. The atony of the circulation is usually indicated by paleness of the lips, face, and tongue, by pastiness of the skin, by effusion into the serous cavities, and by rheumatic deposits."

Convulsion happens most frequently in women and children, and but rarely in men, and this fact is an argument that other convulsive disorders besides epilepsy are connected with a state which is characterized by weakness rather than by strength.

"Spasm, again, occurs more frequently in women than in men, and most frequently in the more irritable and weakly of women. Cramp is the constant companion of tremulousness. It increases with the advances of age, and is almost permanent when nervous tremors become intensified into palsied tremors. The subjects of catalepsy, in like manner, are more delicate and impressionable than they ought to be. Their skin is usually pale or dingy, their pulse readily disturbed, their general appearance either hysterical or apathetic. A cataleptic boy, a patient of my own, was as irritable, uncertain, and fretful as an infant. His apprehension was slow, his memory weak, his head large, his eyes staring, his pupils dilated and sluggish, his complexion sallow and venous, his hand cold and clammy, his pulse slow and feeble; and lastly, the state in *rigor mortis* is expressed by the name."

The consideration of the pathological condition of the vascular, nervous, and muscular systems in the several diseases and stages of disease marked by tremors, convulsions, and spasm, is followed by a chapter on periodicity. The views of the author in reference to this interesting subject are far from satisfactory, and cannot be received in their full extent as explanatory of the periodicity of disease until established by more convincing facts than have as yet been adduced in their support.

After noticing the indications of periodicity in the physiological phenomena of plants and the lower order of animals, Dr. R. observes:—

"In spite of every cause of perturbation, there are many evidences of periodicity even in man. It is something more than accident which so often causes man to be stunted, stolid, and passionless in countries where cold reigns without a rival. It is something more than accident which times the periodical changes of women by the lunar orbit. There are, indeed, frequent irregularities in all these cases, and particularly in the last, and these may be supposed to be the natural results of the changing periods of food and passion, but the law is apparent above every irregularity.

"It would appear, then, that there are certain periodical changes in vital phenomena which reflect more or less distinctly the movements of the sun and moon, some of them corresponding to the day, others to the month, and others to the year; and that these changes are more and more conspicuous the lower the grade of organization in which they are displayed—more so in woman than in man, more in animals at the foot of the scale of being than those at the summit, and most of all in the plant.

"Returning now to the bedside, it may be expected that the signs of periodicity will always be masked and obscure in man, but that they will be manifested most distinctly in him who is most deprived of that active inherent life which constitutes the badge of distinction between man and the plant, and not in the person who is acted upon by inflammation, or who is excited in any other way. And so it is.

"There can be no doubt as to the obscurity of the evidences of periodicity even where that obscurity is least, as in epilepsy and in affections allied to epilepsy; but there can also be no doubt as to the existence of these evidences. Thus, on looking at a number of cases, it is found that convulsion and spasm occur more frequently at night than in the day, more frequently about the time of new moon, than about the time of full moon, and more frequently in the winter months than in the summer months. Of these evidences of diurnal, monthly, and annual periodicity, the diurnal are the most frequent, and the best established; but all are sufficiently frequent and obvious to convince any one who will take the trouble to seek after them for himself, or to consult the admirable little treatise of Dr. Mead: *De imperio solis ac Lunæ in corpora Humana et morbis inde oriundis*. They are not, perhaps, sufficiently frequent and obvious to allow any theory to be based upon them, but it is impossible to omit noticing that the greater frequency of convulsion and spasm in the night, at the times of the new moon, and during the winter months, is in accordance with the preceding pathological doctrines, and that, being thus in accordance, it is an additional confirmation of the correctness of those doctrines.

"It appears, therefore, that the signs of morbid periodicity are manifested most distinctly in the person who is most deprived of that inherent life which constitutes the badge of distinction between man and the plant, and not in the person who is acted upon by inflammation, or who is excited in any other way; and being so they furnish an important confirmation of doctrine, and a new rule of treatment. The confirmation of doctrine is obvious, for in this point of view the signs of periodicity become only so many additional evidences of that constitutional want of innate strength which appears to be the prominent fact in the pathology of epilepsy and of the cognate disorders. A new plan of treatment is equally obvious, for if the signs of periodicity depend upon a simple want of innate strength, then it becomes necessary to abandon all those leeching and starving plans of treatment which have originated in the supposition that they depended upon internal inflammation, or fever, or some other state of excitement, and to adopt in their stead all the means which are calculated to arouse and invigorate the downcast and flagging powers of the system."

The general plan of treatment for epilepsy and the affections allied to it, laid down by Dr. R., is unquestionably the correct one. At the same time we think he depends too exclusively upon a tonic and stimulating course, to the exclusion of all other remedial measures, however strongly they may seem to be indicated by the morbid condition of various organs which is so often associated with epilepsy and the cognate diseases.

A full diet of nutritive and easily digestible animal food, without the usual quantities of farinaceous and green vegetable matters, is insisted upon by Dr. R., as essential in all cases of epilepsy.

The propriety of such a diet in all cases in which the patient can be induced to take it is admitted. In many cases, however, the appetite and digestive powers of the stomach are so impaired in the epileptic, that the patient is either averse to taking food of a proper kind, or if he can be induced to do so even to a very moderate extent, it produces considerable distress and other unpleasant symptoms. In such cases, the digestive powers of the stomach must be restored by an appropriate course of treatment before the full animal diet, recommended

by Dr. R., can be carried into effect, with any hopes of deriving from it the desired restorative and invigorating effects.

Dr. R. is in the habit of recommending a very liberal allowance of alcoholic stimulants to his epileptic patients; and he states that, from the result of this practice, he is fully satisfied that there is no disease in which they are more needed. He believes epileptics to be benefited by the use of coffee, and injured by the use of tea.

That there may occur many cases of epilepsy, in which the use of alcoholic stimulants are required, we admit; but we fear that, to allow their "very liberal use" in all cases, indiscriminately, would be apt to do far more injury than good. We can see no objection to the substitution of coffee for tea.

The epileptic's habits should be so ordered as to save the strength as much as possible. Hence Dr. R. very properly advises celibacy, abstinence from any severe study, and from bodily exercise.

"Often," Dr. R. remarks, "I have found a patient to improve in a marked and unmistakable manner as soon as he had had the resolution to conquer the fidgetiness which is invariably connected with debility, and to force himself to rest; and often I have known a patient begin to retrograde if he had begun to try his strength too soon. Only the other day, I had a note from a medical gentleman, in which he told me that a patient, about whom he had consulted me, had gone on very well so long as he had made a point of riding to his place of business, and that the fits had returned as soon as he had begun to disregard this direction."

As tonics in epilepsy, Dr. R. prefers quinia and iron.

Of turpentine he speaks in the highest praise, as "the remedy which stands foremost among those which have rendered unequivocal service in epilepsy." Its nauseous taste, however, and the irritation which it excites in the urinary and generative organs, have always been a serious objection to it, and the result has been that comparatively few patients have the resolution to persevere in its use as long as is necessary to insure permanent benefit. Dr. R. was, in consequence, induced to substitute naphtha for turpentine, and found that in doses of half a drachm to a drachm it produced the same decided relief as the turpentine; but it was scarcely less disagreeable, and patients could not be induced to take it for any length of time.

"After this," says Dr. R., "it occurred to me to try camphor, and this I did in doses of two or three grains, either alone or in combination with quinia or iron, one or both, according to circumstances. Being given in the form of pills, it was free from the principal objection applying to the two former stimulants, and it had this peculiar advantage, that instead of irritating the urinary and generative organs like turpentine, it exercised, or seemed to exercise, a direct quieting influence upon them. In other respects, as tried in several cases, the result was not less satisfactory.

"Next in order of time I gave a fair trial to chloric ether, and still with very decided benefit. Under ordinary circumstances, I gave half-drachm doses of this preparation, either alone or in combination with the ammonio-citrate of iron, or quinia, or naphtha, and in all cases it proved to be a very favourite and effective remedy, particularly with children. Sometimes I substituted Hoffman's anodyne in place of the chloric ether; and sometimes, when the need of a stimulant has seemed to be very urgent, I have associated the two, but it has always seemed that this form of ether is far less efficacious than chloric ether.

"In cases where, and at times when, an occasional stimulant effect was necessary, I have recommended the aromatic spirit of ammonia, either alone or in combination with ether, and the result has usually been certain and satisfactory."

In addition to internal stimulants, Dr. R. employs, externally, counter-irritants, and the hot bath.

Dr. R. recommends a hot bath daily, and an additional one whenever any unusual depression tends to the apprehension of a fit. From the adoption of this practice he has seen many instances of marked and decided benefit.

"This plan," he remarks, "seems to be equally desirable in long-standing cases, where there is much cerebral congestion, and theoretically and practi-

cally there is much reason to believe that this is what might be expected, especially if a towel dipped in cold water be wrapped around the head of the patient while he remains in the hot bath.

"In actual practice," says Dr. R., "I have rung changes upon these different stimulants, either giving them alone or combining them with iron and quinia, substituting one for another according to the changing circumstances of the case, and always allowing at the same time a liberal supply of dietetic stimulants, upon which, indeed, hope is mainly to be based, and I have every reason to be satisfied with the results. I have never met with a patient who has not been benefited; for even where the case has been of long standing, and the fits have kept their ground, there has been a manifest diminution of intellectual torpor, the face has lost a good deal of the brutalized expression which had been creeping over it, and the distressing nervous headache has disappeared, if that symptom had been present—and I have met with many patients who have been completely cured.

"If there is one time more than another when stimulants are necessary, it is on the eve of the fit. Then, vigorously administered, they will often prevent the paroxysm. Nor are they contra-indicated in the fit itself. At this time all that is usually required is to raise the head as much as possible, so that the blood may not gravitate into it, and to unloose the neckerchief and shirt-band; but if more is required, it is still upon stimulants that dependence must be placed, and this equally, whether the circulation be in a syncopal or asphyxial state. Indeed, under these circumstances, the proper course is to dip a door-key or hammer-head into boiling water, and apply it to the pit of the stomach, or to put the patient into a hot bath, or to take advantage of a moment of quiet and inject a turpentine enema into the rectum. Nor are stimulants contra-indicated after the fit, except perhaps during the first few moments of the reaction which follows upon the collapse, and this only in some instances, for often this reaction is not up to the normal standard. Nay, they are not necessarily contra-indicated by the mental excitement which occasionally supervenes upon the fit, for this excitement is usually, if not always, of an asthenic character.

"All these considerations are in harmony with what might be gathered from a simple inspection of the state of the pulse (the true key to practice), and the conclusion is that stimulants will be found to be the proper remedies for epilepsy, if they are given with discrimination, and regulated in quantity according to the heat or coldness of the season."

With regard to tracheotomy as a remedy in epilepsy, Dr. R. remarks that it is not easy to come to a decision, inasmuch, especially, as there is an insufficiency of evidence on the subject.

"Still," he observes, "it is clear that it does not fulfil all the original expectations of Dr. Marshall Hall concerning it. It does not prevent convulsion. It does not always, or even usually, make the convulsions lighter. It does not prevent danger, for of the few patients upon whom the operation has been performed, three have died either in the fit or in connection with the fit, and of these three, the opening in the windpipe was free from obstruction—at least in one. Under these circumstances, it becomes a question whether the benefits of the operation are sufficient to counterbalance the associated inconveniences and dangers, even where (which rarely happens) the asphyxial symptoms are consequent upon spasmodic closure of the larynx—and this question must remain in abeyance for the present.

"—— As to the rest, it only remains to be said that the accustomed rules of treatment must be applied to the correction of any special source of exhaustion, and particularly of those which are peculiar to female epileptics."

In reference to the treatment of affections allied to epilepsy, Dr. R. recommends a similar invigorating, tonic, and stimulating course. The general conclusion is—

"That epilepsy and the cognate disorders must be treated upon the same principles, and that upon these principles every cause of depression and exhaustion must be avoided, every means of increasing and establishing the strength must be sought after, and stimulants must be trusted to as the grand

agents in recovery. In a word, physiology, pathology, and therapeutics concur in showing the necessity of a complete revolution in everything relating to the theory and practice of the maladies which have been under consideration, and they also justify the hope that in future the theory will not be a subject of mystery, or the practice a source of conjecture, perplexity, and failure."

The essay of Dr. Radcliffe is well deserving of an attentive perusal on the part of the medical practitioner. The views of the author in reference to the nature of muscular contraction, and the influence exercised upon it by nervous and other vital agencies and by physical forces may, it is true, receive but little favour; nevertheless, his general conclusions as to the pathological conditions under which tremor, convulsion, and spasm ordinarily occur, which are by no means necessarily dependent upon the truth of his physiological doctrines, as well as his general directions for the treatment of those affections of which tremor, convulsion or spasm is the prominent characteristic, are worthy of serious consideration.

D. F. C.

ART. XIX.—*A Clinical Introduction to the Practice of Auscultation, and other Modes of Physical Diagnosis, in Diseases of the Lungs and Heart.* By H. M. HUGHES, M. D., Fellow of the Royal College of Physicians, &c. Second American from the second and revised English edition. Philadelphia, Blanchard & Lea, 1854. 12mo. pp. 304.

THIS little work is of that kind which will surely meet with many readers. The author has contrived to present to the student, in a comparatively small compass, a comprehensive, accurate, and well-arranged exposition of the leading principles and facts in the physical diagnosis of diseases of the chest. His language is plain, and the book is free from all that unnecessary discussion of the laws of sound, and of doubtful questions which are so apt to embarrass the learner in his efforts to discern and comprehend the essential points in this important branch of medicine. As its merits consist mainly in the manner in which the subject is presented, we shall be excused from offering an analysis of the work; it is only necessary to state that the author expresses his dissent from the views of Skoda, especially in the very general application of the "*laws of consonance*" to diseases of the chest. We append, however, the following explanation of a curious fact: "In some cases, which are not so rare as it has been by some authors supposed, it happens that though the pleura is actually full of fluid, and may be proved to be so by inspection after death, not only is tubular breathing general, but a shrill resonance of the voice is distinctly audible over the whole side. Though the lung be compressed into the smallest space, and the bronchial tubes be therefore far removed from the solid parietes, in all parts excepting in the neighbourhood of the spinal column, still, their vibrations are communicated to those parietes, and from them to the ear. How does this happen? It is, indeed, difficult positively to assert how; and because difficult to explain, the fact itself may be questioned. The same thing, however, in regard to the voice, as well as to the tubular breathing, has occurred in persons from whose chests, immediately after the examination and observation of these signs, several pints of fluid have been drawn off by paracentesis. How, then, are these circumstances to be explained? It is acknowledgedly one of those cases in which ordinary acoustic principles appear (most probably from our not being aware of the whole or the exact circumstances of the case) to be insufficient for the satisfactory explanation of what is occasionally heard in the practice of physical diagnosis. If a conjecture might be ventured upon the subject, it would be this: so long as there exists any portion of the lung which is capable of further compression; so long, therefore, as the parietes are not tense, and the fluid contained in them, although in large quantity, is movable, so long is bronchial respiration inaudible over the general surface of the side. But when the compression is great enough to render the