

shell-fish and fish generally. 3rd. The assertion made by some, that phosphorus could only be assimilated by previous conversion into phosphoric acid, was combated, the effects of the two being shown to be perfectly different, phosphoric acid producing in large doses fatty degeneration of the heart, liver, and kidneys, whereas phosphorus produced necrosis of the jaw-bone, and excited the nervous and sexual system. The opinion of Dr. Von Bibra was also quoted in evidence of this. Phosphorus also reduced or removed congestion of the brain. 4th. Dr. Routh next showed that those diseases produced by weakened nervous matter, or anuresis, were precisely those which were cured oftentimes by the internal administration of phosphorus—viz., some forms of paralysis, eczema, and other skin affections, cerebral congestions with great debility and insomnia. The authority of several writers was cited on these points—Delpech, Professor Fischer, of Berlin, Dr. Eames, Dr. Burgess, and Dr. Hammond, of New York. 5th. The special treatment indicated in these cases was next considered. (1) Complete rest of mind, especially abstinence from all occupations resembling that upon which the mind had been over-worked. (2) The encouragement of any new hobby or study, not in itself hurtful, which the patient might select. (3) Tranquillity to the senses which especially give in these cases incorrect expressions, putting only those objects before them calculated to soothe the mind. (4) A very nourishing diet, especially of shell-fish. (5) The internal administration of phosphorus, whether in its allotropic form or as the “*solutio phosphori medicati*,” prepared according to Dr. Hammond’s formula. (N.B. To be had of Mr. King, Crawford-street.) Some cases bearing out the author’s views were subjoined, but not read, owing to the lateness of the hour.

Dr. FARQUHARSON thought that this high-pressure age involved competition almost before the child was out of petticoats: he could not get into a public school without a severe examination. Many great minds gave way now under over-pressure and worry; this was the case very much in England. Those incomparable workers, the Germans, were wiser; their hours were earlier. He had seen over-work in boys set in as a sharp febrile disorder: there were symptoms of severe brain disorder, which was followed by loss of mental power. Care was required in allowing patients to resume their ordinary active intellectual work. It was very important to procure sleep. Small doses of narcotics were not so useful as fuller doses.

Mr. JABEZ HOGG asked if any ophthalmoscopic examination had been made. He had found the retina in an anæmic state.

The PRESIDENT thought it was rather over-worry than over-work that was injurious to the full-grown brain. Neglect of ordinary hygienic rules, accompanied by worry and much work, was injurious. Over-work was, he thought, injurious to the young, but not to the adult.

Dr. ROUTH concurred generally in Dr. Farquharson’s views. He (Dr. Routh) had not made any ophthalmoscopic examinations. He thought worry was an evidence of failing power. Anything which exhausted phosphorus in brain caused failing mental power; its restoration was therefore indicated.

Reviews and Notices of Books.

The Expression of the Emotions in Man and Animals. By CHARLES DARWIN, M.A., F.R.S. With Photographic and other Illustrations. pp. 374. London: Murray. 1872.

[FIRST NOTICE.]

THE expression of the emotions commences so early and is so constantly before us, we are so accustomed to read the passing thought in the play of feature and the gestures of the body, that we scarcely realise the complexity of the muscular actions by which they are effected, or the difficulties that present themselves in attempting to frame a rational explanation of their cause. Why, in the full expression of the pleasurable emotions of the mind producing laughter, should the eyes sparkle, the orbicularis palpebrarum and occipito-frontalis, the risorius, and zygomatic con-

tract, the orbicularis oris relax, the breath be expelled in short puffs, the vocal cords be approximated so that musical sounds are produced, and a flood of nervous energy, especially in children, be directed to the extremities?—and how comes it that such feelings are expressed in a nearly similar manner by all the varieties of the human race? How is it, again, that grief is recognisable in all sorts and conditions of men by the contraction of the corrugator supercillii and depressor anguli oris, the tear in the eye, and, where unrestrained by screams, interrupted inspiratory efforts and general muscular movements? Such are the questions that Mr. Darwin proposes to solve in the work before us; and, though it must be admitted that here and there his explanations are far-fetched, it is not easy in any instance to substitute better.

Mr. Darwin considers that the three following principles will account for most of the expressions and gestures involuntarily used by man and the lower animals, under the influence of various emotions and sensations:—1. The principle of serviceable associated habits. And this he proceeds to explain by stating that certain complex actions are of direct or indirect service, under certain states of the mind, in order to relieve or gratify certain sensations, desires, &c.; and whenever the same state of mind is induced, however feebly, there is a tendency, through the force of habit and association, for the same movements to be performed, though they may not then be of the least use. Some actions ordinarily associated through habit with certain states of the mind may be partially repressed through the will, and in such cases the muscles which are least under the control of the will are the most liable still to act, causing movements which we recognise as expressive. In certain other cases the checking of our habitual movement requires other slight movements, and these are likewise expressive. 2. The principle of antithesis. Certain states of the mind lead to certain habitual actions which are of service, as under the first principle. Now, when a directly opposite state of mind is induced, there is a strong and involuntary tendency to the performance of movements of a directly opposite nature, though these are of no use, and such movements are in some cases highly expressive. 3. The principle of actions due to the constitution of the nervous system, independently from the first of the will, and independently to a certain extent of habit. When the sensorium is strongly excited, nerve-force is generated in excess, and is transmitted in certain definite directions, depending on the connexion of the nerve-cells, and partly on habit; or the supply of nerve-force may, as it appears, be interrupted. Effects are thus produced which we recognise as expressive. This third principle may, for the sake of brevity, be called that of the direct action of the nervous system.

Upon one or other of these three principles Mr. Darwin thinks that most of the different movements that express our emotions may be explained. In regard to the first category of serviceable associate habits he first considers reflex actions, and thinks that many were originally performed consciously, but have become fixed by constant repetition in successive generations of animals; that they are now performed, not only when the same sensation as that by which they were originally called forth is experienced, whether strong or weak, but even when an analogous or associated sensation is felt, though they may now no longer be of any use. The winking of the eyelids on the sudden approach of any object, coughing, and sneezing, are examples of useful reflex action; whilst the scratching movements made by dogs, wolves, and jackals, after voiding their excrement, as if to cover it, and many other instances, are, on the other hand, examples of reflex inherited movements,

now become purposeless. The sudden start and deep inspiration when a loud sound is heard appears to occupy an intermediate position between the two above mentioned; the latter complex operation being the natural preparation for any violent effort. Mr. Darwin remarks that the violent action of the heart which accompanies the start of terror is an instance of an organ which has never been under the control of the will partaking in the general reflex movements of the body which he finds difficult to explain. And so in regard to the contraction of the iris when the retina is stimulated by a bright light, he observes that this is another instance of a movement which cannot have been at first voluntarily performed, and then fixed by habit; for the iris is not known to be under the conscious control of the will in any animal. Now there appears to be a feasible explanation of the violent throbbing of the heart in the start of terror in the contraction of the smaller vessels which accompanies such fear. This, with the violent contraction of many muscles, would surcharge the heart with blood, and it would naturally beat vigorously and rapidly to unload itself. In regard to the iris, Mr. Darwin must have for the moment forgotten the birds, many of which appear to have a voluntary power over the movements of the iris; which power, if possessed by other animals in our own ancestry, would obviate the necessity of recurring to more recondite explanation, though, as he says, the "radiation of nerve-force from strongly excited nerve-cells to other connected cells—as in the case of a bright light on the retina causing a sneeze—may, perhaps, aid us in understanding how some reflex actions originate."

The principle of antithesis he illustrates by descriptions and very faithful drawings (made by Messrs. Rivière, May, and Wood) of dogs and cats in an angry and affectionate frame of mind, showing how the ordinary position and movements of the animals are reversed according to their mood, though precisely opposite in the dog as compared with the cat.

The principle of the direct action of the nervous system on the body he illustrates by the change of colour in the hair, which follows great mental emotion; trembling, though he omits as one of the causes of trembling anxiety, which cannot be included under either fear, joy, or anger; and the movements accompanying rage, pain, &c.

The fourth and fifth chapters are occupied with the means of expression in animals generally, and the special expression of certain animals. Amongst the former are the emission of vocal sounds, the erection of the hair or crest, and the inflation of the body, the clattering of spines as in the porcupine, or of scales as in the rattlesnake; the opening of the mouth and retraction of the ears as in all carnivora, and, as Mr. Darwin believes, in all animals that fight with their teeth, may be enumerated, whilst amongst the latter, as might be expected, he singles out the dog, the cat, the horse, ruminants, and monkeys, and he gives many interesting details in regard to the manner in which they express their emotions. Dogs and the higher monkeys he thinks undoubtedly express pleasure by grinning and incipient smiles; chuckling and a kind of laughter can be induced in chimpanzees and young orangs by tickling or presentation of favourite food.

The Physicians and Surgeons' Visiting List, Diary, Almanac, and Book of Engagements for 1873. London: John Smith and Co., Medical Stationers, Long-acre.

The British Almanac and Companion, or Year-book of General Information for 1873. London: Printed for the Company of Stationers, and sold by J. Greenhill, Ludgate-hill.

AMONG the things which remind us how the years are ebbing away, and how soon the successor of 1872 will put

in its appearance, is the season for the arrival at our office of a batch of almanacs and diaries for 1873. First of all we encounter the well-known "Physicians and Surgeons' Visiting List," which is now in the twenty-seventh year of its age, and promises to go on for many a long year yet; indeed, the end of the career of Smith's Visiting List will probably be coincident with the end of doctors and patients.

"The British Almanac and Companion" has attained its forty-sixth year. It contains, as usual, a large amount of excellent and useful general information, which is very well arranged. It is cheap enough at four shillings—the price of the volume when the Almanac and Companion are bound together.

THE FOSSIL MAN AT MENTONE.

By J. HENRY BENNET, M.D.

ALTHOUGH I was at Mentone on the discovery of the Fossil Man on the 26th of last March in the Baoussé Roussé caverns by my friend M. E. Rivière, and although I have followed with intense interest each successive stage of his researches, I have hitherto refrained from sending an account of the discovery. I wished to give time to my friend M. Rivière—a distinguished geologist entrusted by the French Government with the scientific exploration of the Mentone caverns—to clear up all the facts connected with his important discovery. This he has now done; and I am able to place before the scientific world in England accurate data derived from an exhaustive memoir which he is about to publish, the proofs of which he has placed in my hands. This I do with his entire consent and approbation.

Up to this time M. Rivière himself has been anxious that no premature or immature statements should be made on his authority, and he has had no part in the sensational statements that have appeared in the literary press. Now, however, that he has cleared up the actual facts of the case, he is desirous to see them placed before the scientific world.

The skeleton was carefully taken up last April, and transferred to Paris, where it lies in the anthropological department of the Geological Museum, and where it has been examined by many of the most eminent scientific men of the day. Most of the bones, instruments, and fossils found in the cavern above, around, and below the skeleton have been minutely investigated and studied by M. Rivière, with the assistance of Professors Gervais and Senechal for the animals, and of Professor Deshayes for the shells. Their specific characters have thus been accurately defined and settled. It is this fact that gives extreme value to M. Rivière's forthcoming publication, which the present statement forestalls.

The bone caverns at Mentone have for some years past attracted the attention of scientific geologists. I have given a complete account of them in the successive editions of my climate work, "Winter and Spring on the Shores of the Mediterranean," and cannot better or more briefly describe them than by copying a paragraph from my last edition (1870): "On the shore, at the entrance of the eastern bay, in the 'red rocks,' as they are called, are several good-sized caves, which contain in great abundance organic remains—the bones of large and small mammifers,—imbedded in hard sand, ashes, and in calcareous matter. The organic remains thus imbedded cover the floor to a depth of many feet, and are mixed with the flint weapons and utensils and knives which have excited so much attention during the last few years, testifying as they do to the existence of races of savage men in far back pre-Adamite times. The existence of flint weapons among the bones found in the Mentone caves was first publicly announced, I believe, in 1856 by M. Forel, a Swiss geologist. He published in 1860 a memoir, in which he gives the result of his researches. M. Forel's investigations were principally made in the third and fourth caves, counting from Mentone. He found a

her last pregnancy she had discovered a small lump in the left breast. Two months after her confinement she came under Mr. Nunn's observation. The tumour was at that time undefined. After two months the patient suffered from ptosis of the left eye, and ultimately from paralysis of the third nerve generally. She became extremely fat, and died paralysed in her lower extremities, frequently having suffered from severe neuralgic pains in the upper cervical and dorsal regions. Towards the end of her life the temperature in the axilla was 104°, the cancer of the breast having become of stony hardness. Mr. Nunn remarked upon the uncertainty of surgical practice in respect of cancer, which, he said, must remain uncertain so long as our knowledge of the disease was incomplete. The variety of forms in which cancer presented itself was in some measure due to the modification of the disease by the peculiarity of the structure in which it was found, and by the situation and surroundings of the selected structure. In the first case, the cancer occurred in an unmarried undersized woman, whose frame was undergoing involution; in the second case, the disease appeared in a woman in full reproductive activity. Assuming cancer to be a local disease, we were still unable to say what rendered the cancer-germs stationary, living their life and undergoing retrograde changes without travelling to distant parts and there proliferating; and we were unable to tell what constituted the difference between cancer-germs content with a local career, and those of a propagandist order, or what conditions provided each of these opposite degrees of activity. Was non-contamination due to resistance of the parts or tissues exposed to contamination, or to some local change in the cancer destroying its power of contaminating? What share had inflammatory action, by softening the tissues and stimulating proliferation, in promoting diffusion? Assuming, on the other hand, that cancer was a blood-disease, how could one justify the removal of a cancer by operation? A clinical study of cancer showed that, if the surgeon did not step in with knife or with caustic, the disease itself, by inducing gangrene or ulceration, produced a wound that very rarely healed; and that, therefore, the surgeon did in a clear and effectual manner, *pro tempore*, what sooner or later the disease would more painfully and ineffectually attempt. Mr. Nunn asserted that he had seen no instance in which diffusion of cancer was really accelerated by operation.

Dr. C. THEODORE WILLIAMS thought it noteworthy that in one of these cases the administration of cod-liver oil was followed by a great deposit of fat.

Mr. NUNN said that he considered the "fat" due to dyscrasia, and not to the oil, although the latter was administered and taken for about two months.

Mr. HULKE read an account of a case of Œsophageal Spasm in a child.

The CHAIRMAN asked if any dilatations of, or pouches in, the œsophagus were diagnosed, and quoted a case in which two well-marked dilatations were found.

Mr. HULKE said that nothing of this sort was discovered, and that the history of the case militated against such an hypothesis.

As the usual hour of adjournment was close at hand, the reading of Dr. Theodore Williams's paper "On the treatment of Pyrexia in Phthisis by Cool Baths," was deferred until the next meeting.

Reviews and Notices of Books.

The Expression of the Emotions in Man and Animals. By CHARLES DARWIN, M.A., F.R.S. With Photographic and other Illustrations. pp. 374. London: Murray. 1872.

[SECOND NOTICE.]

THE second portion of Mr. Darwin's book, including Chapters VI. to XIV., which are chiefly devoted to the expression of the emotions in man, will probably be most eagerly read, and prove most interesting to the greater number of readers; and these chapters are, indeed, full of the results of close and long-continued observation. Mr. Darwin first considers the expression of suffering, and gives

a plate representing six children crying, taken by the instantaneous photographic process. In adults, he says, the signs of severe pain are screams or groans, with writhing of the whole body and grinding of the teeth. To these succeed sweating, pallor, trembling, and faintness. Children who often cry from slight causes, scream, and whilst screaming their eyes are firmly closed, so that the skin round them is wrinkled, and the forehead contracted into a frown. These last actions, which are accomplished by the corrugators orbicularis palpebrarum and pyramidalis, Mr. Darwin thinks are protective, preventing the eyes from becoming too much gorged with blood. In addition, the levator and depressor anguli oris, with the common and special elevators of the lip, contract and open the mouth widely, apparently for the purpose of allowing the full volume of sound to issue. The evidence that the use of the orbicular muscles is to protect the eyes from being over-gorged with blood adduced by Mr. Darwin is, that these muscles are always brought into play when violent expiratory movements are made, as in shouting and laughing, but not when other muscles, as those of the limbs, are actively contracted. The contraction of the orbiculars during screaming is therefore a distinctly serviceable associated habit, and comes under Mr. Darwin's first principle. In after-life the habitual repression of the expression of the emotions, in the educated classes at least, causes the full action of the several muscles to be rarely witnessed; but most people must have experienced the remains of these associated actions in slight quivering of the lips, or contraction of the depressor anguli oris, in reading an affecting passage in a good writer aloud.

Then follows a very interesting discussion on weeping; the association of which with grief or mental depression is made out by the following ingenious train of reasoning:—

"Children when wanting food, or suffering in any way, cry out loudly, like the young of most other animals; partly as a call to their parents for aid, and partly from any great exertion serving as a relief. Prolonged screaming inevitably leads to the gorging of the bloodvessels of the eye; and this will have led, at first consciously and at last habitually, to the contraction of the muscles round the eyes in order to protect them. At the same time the spasmodic pressure on the surface of the eye, and the distension of the vessels within the eye, without necessarily entailing any conscious sensation, will have affected, through reflex action, the lachrymal glands. Finally, through the three principles of nerve-force readily passing along accustomed channels—of association, which is so widely extended in its powers—and of certain actions being more under the control of the will than others,—it has come to pass that suffering readily causes the secretion of tears, without being necessarily accompanied by any other action."

The absence of tears in infants up to the age of three or four months during a fit of crying is very remarkable, considering the facility with which they are poured forth in adults. We have, however, known one case where they rolled freely down the cheeks in a rather delicate child under a month old. It has been ascertained that some animals, as the Indian elephant, weep.

The subjects of the facial expression in laughter and joy, and whilst under the influence of the tender feelings, devotion and love—in meditation and ill temper, in anger and defiance, in astonishment and fear, as well as the phenomenon of blushing, are all considered at great length. The vertical nod of affirmation or approval, and the lateral movement of the head to express dissent, which are common, though—as it appears from Mr. Darwin's extensive inquiries—not universal, signs, he traces to the movements of a child at the breast, corroborating his view by evidence derived from Laura Bridgeman, the blind deaf-mute, and from idiots. The snarl or sneer of defiance, pretty similar when expressed, though not very common, throughout the human race, in which the head is raised, the eye looks

obliquely outwards and downwards, and the canine tooth of one side is exposed, is very remarkable as an expression of an emotion in man, since it does not occur in the monkeys, and Mr. Darwin thinks it shows that our anthropomorphous ancestors had large canines.

Perhaps one of the most interesting chapters is that on blushing, the limitation of which to the upper part of the body is cleverly explained. Mr. Darwin maintains that the fundamental element in the acquirement of the habit has been the direction of the attention to the personal appearance, and not to moral conduct. In support of this view, he observes that the slightest reference to the personal appearance, and even to the dress, of a shy person will make him blush; and this is particularly noticeable when the observation has been made by one of the opposite sex. Now, of all parts of the body the face is most regarded, from its being the chief seat of expression and the source of the voice. It is also the chief seat of beauty and of ugliness, and throughout the world is most ornamented. The face, therefore, during many generations has been subjected to much closer and more earnest self-attention than any other part of the body. But when attention is closely directed to any part of the body, there is, he thinks, a tendency to alterations of the ordinary and tonic contractions of the small arteries of that part. These vessels in consequence become at such times more or less relaxed, and are instantly filled with arterial blood; and this effect will be increased if frequent attention has been paid by many generations to the same part, owing to nerve force readily flowing along accustomed channels, and by the power of inheritance. Through the force of association the same effect will tend to follow whenever we think that others are considering or censuring our actions or character. Mr. Darwin then proceeds to give evidence derived from Sir Henry Holland, Sir Benjamin Brodie, Sir James Paget, and others, showing that the mind can influence the vaso-motor system. The association of this curious paralysis of the sympathetic with temporary confusion of the mind, though it must be familiar to all when once alluded to, has never before, we think, been noticed.

Altogether Mr. Darwin's last work does not yield in interest to any that have preceded it, and from its more general interest will perhaps command, as it certainly deserves, a still wider circle of readers.

The Heart and its Diseases, with their Treatment. By J. MILNER FOTHERGILL, M.D., M.R.C.P. London: H. K. Lewis. 1872.

IF the writing of a new book on diseases of the heart were a justifiable course, few men were better entitled to be the author than Dr. Fothergill. For seven or eight years at least he has been studying this branch of medicine: not in the spirit of a mere pathologist, but in that of a physiologist and physician. Very much has been done of late years, both at home and on the continent, to elucidate heart disease and all its bearings and relations. The progress of physiology, as well as that of pathology, has had this effect. The mechanical and vital problems of the circulation are better understood than they were a few years ago, and the diagnosis and therapeutics of heart disease have correspondingly improved. Dr. Fothergill has not only kept himself *en rapport* with the work of other labourers, but he has himself, as our readers well know, worked in special and practical grooves of this subject. He is therefore entitled to add a new book to the goodly number of treatises which already exist. If we mistake not, the volume will be found a great help to practitioners, and a fair if not a faultless exposition of the present state of knowledge.

We shall briefly state the general plan of the book, and then indicate some points worthy of more special notice. The first and second chapters are devoted to an anatomical account of the heart, its mode of acting and resting, its innervation, its position, and the mode of examining it by percussion, palpation, auscultation, &c. Chapter III. treats of the objective symptoms of disease—palpitation, irregularity, intermittency, and of their value for purposes of diagnosis and prognosis. The contents of this chapter have, in the main, appeared in our columns. In the fourth chapter are discussed the subjective symptoms of heart disease. The fifth, sixth, seventh, eighth, ninth, and eleventh chapters treat of the principal lesions of the heart, including hypertrophy, dilatation, endocardial and pericardial affections, and the various diseases of the muscular and connective tissue. Chapter X. is devoted exclusively to the general treatment of heart disease. Chapter XII. refers to nervous disorders of the heart, angina, nervous palpitation, irritable heart, &c. In the next chapter the great question of the relation of heart and kidney disease is considered. The fourteenth chapter treats of diseases of the great vessels near the heart—atheroma and aneurism; Chapter XV. of malformations of the heart. The sixteenth is a concluding chapter on various points in diagnosis and prognosis not definitely discussed in previous chapters.

It is difficult to go over such a large field as is represented in this outline without repetition, and without some tendency to theorise, and both of these faults are apparent from time to time. The greatest defect of the book is the want of literary care with which it is written, leading not only to frequent blemishes of style, but occasionally to considerable confusion as to the author's meaning. The printer has been more careless still in doing his work. These faults are so obvious that we need not spend time in specifying them, but they should be carefully rectified in future editions.

The subjects of hypertrophy and dilatation, and the way in which they are combined in different cases, are discussed in detail. The real significance of hypertrophy as a conservative change, meant to compensate for some obstruction to the circulation or some other mechanical disadvantage of the heart, is never lost sight of, and will go far to remove the last vestiges of the notion that hypertrophy is a condition to be opposed and removed. In the chapter on the relation of kidney disease and hypertrophy of the left ventricle, the views of Dr. George Johnson are in the main adopted; according to which the left ventricle becomes enlarged as a consequence of thickening of the muscular wall of the arterioles caused by the abnormal quality of the blood in kidney disease.

A characteristic feature in Dr. Fothergill's view of the causes of heart and arterial disease is the importance attached to *strain*. We have been hitherto too much in the habit of attributing all these changes to certain undefinable tendencies to degeneration, to certain diatheses, especially the gouty, to alcohol, and the like. And no doubt these are very important factors. But over and above these is the influence of strain; and, if the author is right, this has much to do in the production of atheroma, of aortic regurgitation, and of hypertrophy of the walls of the heart. There will be little disposition to dispute the influence of strain in the causation of disease in the aortic valves, or of thickening of the left ventricle, especially in the light of the evidence adduced by Dr. Clifford Allbutt and other physicians; but it will not be so readily credited that atheroma of vessels is so produced. But the more the favourite situation of atheromatous spots—at points of most tension—is studied, the more considerable will the influence of strain appear. Strain has this further and great importance, that