November 10. Since the last report his health has been improving, but the wounds heal slowly.

It will be sufficient to add that the patient continued to improve, and eventually entirely recovered. The joint became ankylosed, which disabled him from walking without support.

PROFUSE HÆMORRHAGE

FROM A

SMALL VARICOSE ULCER ON THE LEG.

Mary Ann Baker, aged 36, by occupation a mangler, has been laboring under, for the last twelve-month, enormous varicose veins of both legs, which were at times exceedingly painful and tender. On the lower part of the right leg was situated a small ulcer, which would not heal. She was induced to apply a variety of remedies from time to time, but nothing gave her anything like permanent relief. She was accustomed to use a bandage, and on Saturday applied it rather tighter than usual. Just after she had adjusted it, as she was retiring to rest, she was attacked with a profuse hæmorrhage which appeared to issue from the lower part of the leg, near the wound. She called for her mother, who immediately ran for my assistance, and fortunately, finding me at home, I went immediately to her house, and found her in her bed-room, lying on the floor, in a state of extreme syncope, and bleeding profusely. The floor was literally covered with blood. I instantly removed the bandage, which I found exceedingly tight on the centre of the leg, and discovered that the blood issued from the wound, which was not larger than a shilling. I introduced lunar caustic pretty freely and a pledget of lint over it, which controlled the hæmorrhage. In the course of an hour she revived, but complained of great pain in the wound.

The dressings were allowed to remain for several days, when they were removed, and the wound looked inclined to slough. I ordered a carrot poultice, which soon separated the slough, and the wound, with common applications, healed rapidly.—J. W. W.

OBSERVATIONS

ON

HYPERTROPHY OF THE BRAIN IN CHILDREN.

By CATHCART LEES, M.B.,

Physician to the South Dublin Union, and to the Institution for the Diseases of Children.

Although the much greater development of the brain in some cases than in others, as well as its apparent disproportion to its osseous envelope, has been occasionally noticed by pathologists, as Morgagni, who observes, "that in some bodies which he had examined, the brain appeared large for the cranium which enclosed it, and on this account seemed to be compressed;" yet, it is only within the last few years that the attention of the profession has been directed to this subject, or any inquiry made, as to whether this condition might not be ranked as a peculiar abnormal state, manifested by certain lesions of functions, and presenting a group of special symptoms. The facts hitherto adduced have been such as, I consider, would tend rather to excite inquiry, than satisfy

conviction, as to its existence, particularly when we find such pathologists as Rostan (to whom science is so much indebted for his researches on the pathology of the brain) classing it as a doubtful state; for without denying its possibility, he evidently considers that it is rather a consecutive state, depending on encephalitis. Bouillaud entertained the same opinion, as we may infer from the subjoined passage of Andral:—"Est-ce là un premier degré d'encephalite, ainsi que le pense M. Bouillaud, qui a publié sur ce sujet d'interessantes observations. Mais pourquoy, dans cette hypothese, la substance nerveuse augmentée de consistance, est-elle en même temps décolorée? une inflammation, ne devrait-elle pas produire l'effet contraire?"*

Dance and Andral, who have given the best description of hypertrophy of the brain, assign to it peculiar anatomical characters,† and dwell particularly on the necessity of distinguishing this state from that of hyperæmia, as it is found to be most frequently in a contrary state, as evinced by its paleness. Their observations, however, refer almost exclusively to adult life, and Dance even appears to consider the age of puberty as a predisposing cause to this state.

In the same chapter, Andral mentions that Laennec had observed this state of the brain as occurring in cases which presented the symptoms of hydrocephalus, and in whom there was but very little effusion; but there was a compressed state of the brain, which he regarded as depending on too active a nutrition. There are not, however, any points of diagnosis laid down to serve to discriminate this state from chronic hydrocephalus, the disease with which it is most likely to be confounded, and which entitles it to the serious consideration of all those who are occupied with the study of infantile diseases, and which induces me to bring forward some cases which have occurred among the children of the institution to which I am attached, and which I trust may assist in establishing certain data to found future observations on, as with the exception of Dr. Munchmeyer,‡ of Lunebourg, this peculiar state (as occurring in children) does not appear to have met with the attention which it merits.§ In some cases reported by Dr. Sims in the Transactions of the Medico-Chirurgical Society, the histories are so imperfectly given that it is impossible to ascertain whether the hypertrophy was the original disease, or merely a consequence of the inflammatory conditions with which, after death, it was found to be coincident. Thus in his first case, that of a girl, aged sixteen, he states that she was subject to some kind of fits to the age of seven years; that she had no paralysis, but a weakness of her limbs, and she died of enteritis, having presented no cerebral symptoms during her last illness.

In another case, that of a child eleven months old, no previous history is given till three days before

* Clinique Medical, vol. v.

† Précis d'Anatomie, vol. ii., p. 775.

‡ Schmidt's Jahrbucher, vol. xxv., 1840.

§ Cruveilhier in his article on Hypertrophy, in the Dictionnaire de Médecine, states, that M. Jadelot had observed, that in many infants who died with the symptoms of hydrocephalus, he had found great disproportion between the brain and the cranium. He merely mentions that the symptoms are those of compression, without making any attempt at diagnosis.

death, when the child was attacked with the symptoms of acute hydrocephalus, and died, when he states that from the soft state of the brain it is probable that an inflammatory process had been going on during the latter period of the child's life. There is no accurate history given of any of the other cases, or any data laid down on which to found any principle of diagnosis. The cases which have occurred in my own practice are three, and although they differ in some points, yet as they all tend to illustrate the important features of this peculiar state, with regard to diagnosis, I shall give each of them in detail.

CASE I.—John Harding, aged two years, a full, heavy-looking child, was admitted into the hospital in May, 1842, for pertussis; his mother states that he has always been healthy, but very *heavy* and *drowsy*, not playful like her other children; his appetite has always been *great*. The head is rather larger than it ought to be in proportion to his age, particularly across the parietal protuberances, which form considerable projections; the frontal bone also projects over the root of the nose; fontanelles perfectly ossified; his eyes are large, prominent, and widely set; the intelligence is perfect, but he appears to be very *apathetic*, and does not mind any object attentively but his food, for which he is very greedy; he is easily made to cry; there was no fever on him, but the paroxysms of the cough were very violent, and frequently succeeded by convulsions, which were general, and in one of which he died on the sixth day of his disease.

On removing the calvarium, the dura mater appeared to be tense, and on dividing it, the cerebrum appeared swollen, and protruded through the membranes; the convolutions appeared to be flattened as if compressed; the vessels of the pia mater were injected with very red blood; the substance of the brain was much congested, but of a firm consistence and very large; there was no serous effusion into the ventricles; there was a slight vascularity of bronchial mucous membrane; the bronchial glands were not enlarged; the larynx was perfectly healthy; there were a very few dark, firm spots, like the dots in pulmonary apoplexy, scattered through the lungs, and quite isolated; all the nerves were carefully dissected, and presented nothing abnormal.

CASE II.—Ann Murphy, aged three, a very delicate-looking child, with the head large in proportion to the body, which is emaciated, particularly the lower extremities; the abdomen is tumid; there is considerable projection of the frontal bone, as also of the posterior angles of both parietal bones; the eyes are heavy, and widely set, so as to give the child the face of one with chronic hydrocephalus; the fontanelles are quite closed and firm, but cartilaginous; she is very cross and greedy, crying whenever she sees food, till she gets it, when she falls asleep over it; in fact she spends her time in crying, eating, and sleeping. Her intellect is obtuse, but appears to be perfect; the pulse was generally regular, and her pupils natural. She had been left at the gate of the hospital, so we did not know her previous history, but she remained some months under my observation previous to her death, which took place gradually from chronic diarrhoea, without convulsions.

The brain weighed two pounds three ounces; the

dura mater was firmly adherent to the cranium; the brain was large, the dura mater being rather tense over it; the substance of the brain was firmer than is natural in a child of that age, and also of a paler appearance; there was not any fluid in the ventricles nor at the base of the brain; in fact, it appeared to be nearly void of either blood or serum; there were not any tubercles in either the lungs or abdomen.*

CASE III.—Mary L., aged seven, light brown hair, delicate skin, appears as if she is always dropping asleep; her pupils are natural; pulse regular; her functions are well performed; her temper is very bad; she will not learn her lessons, but this appears to depend more upon indolence than stupidity; her appetite is very great; her head is not too large in proportion to her body, but there is considerable projection across the parietal protuberances; she complains frequently of headache, and sometimes vomits in the morning. I was consulted on July 10, 1842, for a strumous swelling in the neck of this child, and was so struck by her appearance, that I inquired particularly into her history.

I have placed these cases in apposition, in order that we may compare them with regard to their early symptoms, as I think they are chiefly valuable from their accurate previous history, for in none of the cases which have been hitherto published, has there been any stress laid on this point, which, however, is of paramount importance. In the cases related by Andral, headache, convulsions, and epilepsy, appear to have occurred, but they only came under his observation in the second, or acute stage of this state, when the brain was suffering from compression, as in his cases the dimensions of the cranium were not larger than natural, which must cause a great difference in the symptoms. Thus idiocy, which depends so frequently on atrophy of the brain, may be caused by hypertrophy, if there be much compression, whereas, if the cranium be developed in the same ratio with the brain, there are often no symptoms produced, or but slight ones, as in a case related by M. Scoutteten,† where a child of five years old was affected with hypertrophy of the brain (with enlargement of the skull) to such a degree, that the head became as large as that of an adult, particularly prominent at the occipital protuberances; the cerebral functions were undisturbed, and the only phenomena which the child presented during life were the frequent fallings occasioned by the weight of the head, which was carried forward whenever the child wished to run, and a great tendency to sleep when he remained quiet. He died of acute enteritis, and the brain exhibited a great development of all its parts, with only a small quantity of reddish serum in the ventricles.

* It is very difficult to ascertain with any degree of accuracy, the average weight of the healthy brain at different periods of life, and still more, the weight of it in various diseases, as it must be always open to a source of fallacy, resulting from other causes, as the amount of congestion, fluid, and the results of disease; thus, Dr. Sims has given a table containing the weight of 253 brains in different diseases, and then states that the weight of the brain cannot be fixed by any means, however accurate, which is further proved by several cases given by him, in which the brain was found unusually large and heavy from various causes, but which did not constitute hypertrophy.

† Archives Generales, vol. vii.

Let us now classify the symptoms which the above cases presented, and see how far they may assist us in establishing a diagnosis.

First, with regard to intelligence.

There was a peculiar *obtuseness of intellect*, characterised chiefly by *apathy* to external objects, and a great tendency to drowsiness. There also was evinced a *peculiar irritability of temper*.

Andral states, that in adults, headache, with severe exacerbations, is a prominent symptom; this also occurred in the last case detailed by me. He also mentions weakness of the limbs, often ending in paralysis, convulsion, epilepsy; but these symptoms belong to the second period of this state, when it has passed into the acute stage; but as it is an essential feature of every hypertrophy to develop itself slowly, I have only had an opportunity of studying this state in the first or chronic period, as the two first children died of other diseases before they had reached the second period, which most probably would occur about the second dentition; thus in observation 4th of Andral, the boy became epileptic at the age of seven years, and died comatose, after a fit, at nine years old.

The *appetite was very great* in all the cases which I have noted, and there existed the *peculiar projection of the parietal protuberances*, on which Dr. Munchmeyer particularly insists, and which, I think, may prove a valuable guide in aiding to discriminate this state from chronic hydrocephalus, with which disease it is most frequently confounded. Thus, in the first case related by Dr. Sims, the mother of the child informed him that they had wished to tap the head at one of the hospitals. And Dr. Hennis Green,* in an excellent article on this subject, states that he recently had seen a child who had been condemned to death by a medical man, as having water on the brain, but which was a case of simple hypertrophy, and which did not interfere with the health of the child. The diagnostic sign which he gives, is the sensation of firmness communicated to the finger, on pressure being made over the fontanelles, in cases of hypertrophy, as contrasted with the fluctuating feel in cases of chronic hydrocephalus; but this could not apply in cases of very young children, or in extreme cases.

The prognosis in children is not necessarily unfavorable, for as it is rather an error of development than an actual disease, there is a natural tendency to return to the normal state; the chief danger, in fact, arising from the occurrence of other diseases, as those attendant on dentition, the exanthemata. It is probable that the rapid and sudden deaths which occasionally take place in the malignant forms of scarlatina (some of which I have myself witnessed when the throat has been but slightly affected, and when they die in a very early stage with cerebral symptoms, as if poisoned by the virulence of the disease), may be the result of a state of hyperæmia, superadded to this peculiar state of hypertrophy of the brain. I merely hint at this, from having found myself quite unable to explain the cause of death by the *post mortem* appearances in some of those cases which I have unfortunately met with, and which appear to set all treatment at defiance. The causes of this state are very obscure, but are probably dependant on, or connected with struma; and although the observations

which have been hitherto published with regard to this state, bear reference to it as chiefly occurring in adult life, yet, I think, we must regard it as the result either of an abnormal development of the brain, excited before birth, or depending on primary organisation. For as Tiedeman and Valentine have established that the fetal brain is one of the heaviest and most vascular organs of the body, but presenting little trace of organisation, the primitive type may continue for some years, and thus give rise to hypertrophy, which may remain for a considerable time without interfering with the general health (as we see occurring in other organs, the liver for instance), unless there be either an increase of intensity in its action, or some acute disease supervenes. Thus bearing out the general law of hypertrophy, when existing in other organs, and which is its peculiar feature—viz., that the functional disorders which it entails only extend beyond the affected part, according as the part itself extends its sphere of action, thus differing from other organic lesions which so soon affect the whole economy, wherever may be the seat of the disease.—*Dublin Journal*, September, 1842.

THE THEORY OF RESPIRATION.

By JUSTUS LIEBIG, M.D.

During the passage of the venous blood through the lungs, the globules change their color; and with this change of color, oxygen is absorbed from the atmosphere. Further, for every volume of oxygen absorbed, an equal volume of carbonic acid is, in most cases, given out.

The red globules contain a *compound of iron*; and no other constituent of the body contains iron.

Whatever change the other constituents of the blood undergo in the lungs, thus much is certain, that the globules of venous blood experience a change of color, and that this change depends on the action of oxygen.

Now we observe that the globules of arterial blood retain their color in the larger vessels, and lose it only during their passage through the capillaries. All those constituents of venous blood, which are capable of combining with oxygen, take up a corresponding quantity of it in the lungs. Experiments made with arterial serum have shown, that when in contact with oxygen it does not diminish the volume of that gas. Venous blood, in contact with oxygen, is reddened, while oxygen is absorbed; and a corresponding quantity of carbonic acid is formed.

It is evident that the change of color in the venous globules depends on the combination of some one of their elements with oxygen; and that this absorption of oxygen is attended with the separation of a certain quantity of carbonic acid gas.

This carbonic acid is not separated from the serum; for the serum does not possess the property, when in contact with oxygen, of giving off carbonic acid. On the contrary, when separated from the globules, it absorbs from half its volume to an equal volume of carbonic acid, and, at ordinary temperatures, is not saturated with that gas. (See the article "Blut" in the "Handwörterbuch der Chemie von Poggendorff, Wöhler, and Liebig, p. 877.)

* Provincial Medical and Surgical Journal.